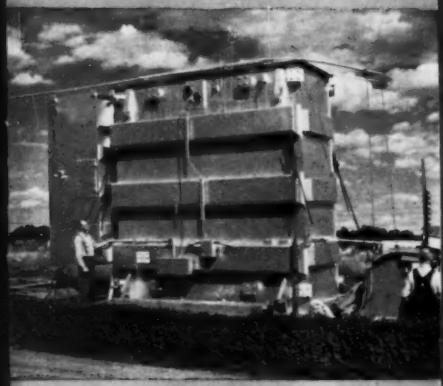
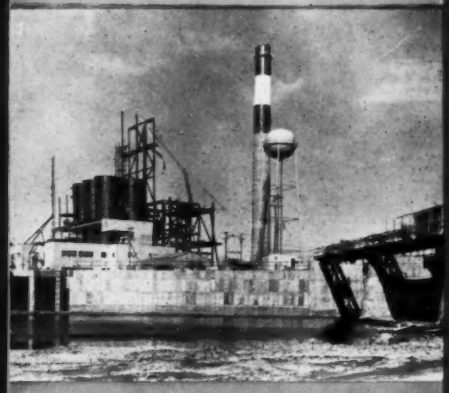
New Transmission



More Transformer Capacity

Biggest Hydro Year

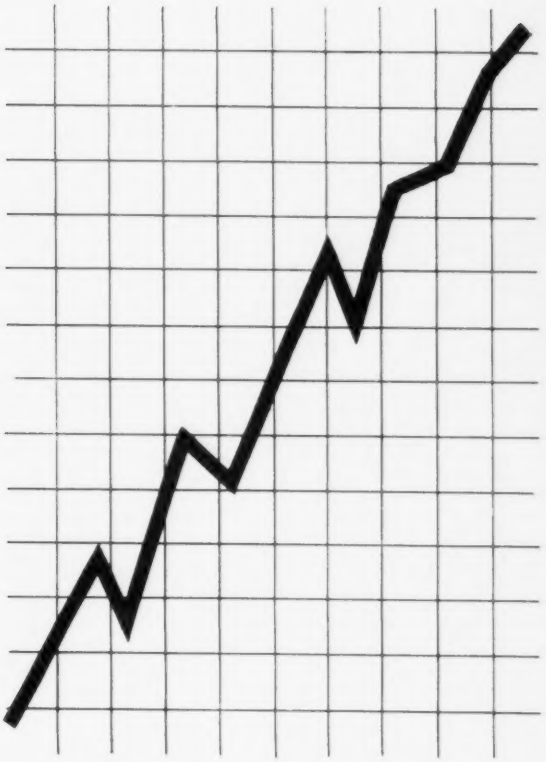


Wyoming's First

ELECTRICAL WEST

February 1958
50 Cents

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.



Annual Review and Forecast

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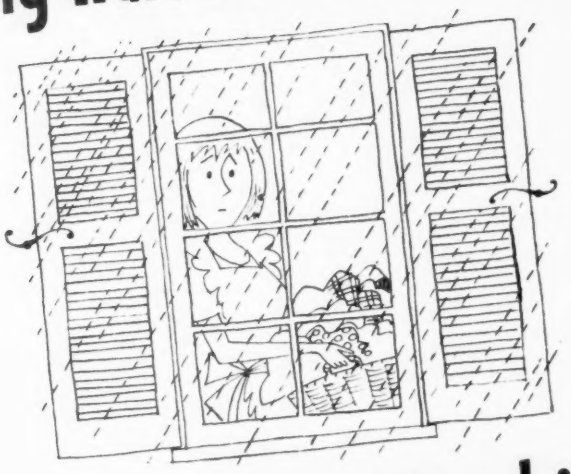
✓ How to Sell the Boss. 96

Edison
is selling the
advantages
of electric drying–
to boost your
electric dryer
sales

Why wait on the weather



–when electricity dries

fresh-air sweet indoors?

Only Electric Dryers can do it. In an electric dryer, radiant coils warm the air inside. There's no flame, none of the by-products of combustion. It's cleaner and purer than any other way of drying. And 32% fluffier than back-yard drying. Best of all – electric drying doesn't fade colors.

Electric dryers not only cost less to buy, but less to maintain. Before you wait on the weather again, see the new electric dryers at your appliance dealer.

LIVE BETTER—ELECTRICALLY • SOUTHERN CALIFORNIA Edison COMPANY

SMOOT-HOLMAN

TWIN-LUX

Luminaires

Light — tailored to fit the need

acrylic or vinyl diffusing panels

Color — controlled to fit the mood

40" x 40" plastic louvers

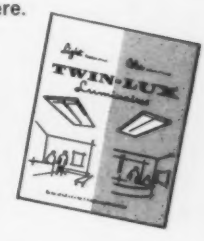
Entirely self-contained Smoot-Holman Twin-Lux Luminaires provide soft, diffused, localized light. The relatively large area of this shallow, two-by-four fixture controls brightness and assures uniformity of illumination. Color filters can be inserted in the louvered style to create the desired atmosphere.

- *Designed for individual installation or end-to-end mounting*
- *Require no structural or architectural changes*
- *Economical to install and maintain*

Certified Lighting

SMOOT-HOLMAN
COMPANY
INGLEWOOD, CALIFORNIA

Send for illustrated, descriptive brochure.



ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

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and incorporating the "Electrical Journal," "Journal of Electricity, Power and Gas," & "Journal of Electricity."

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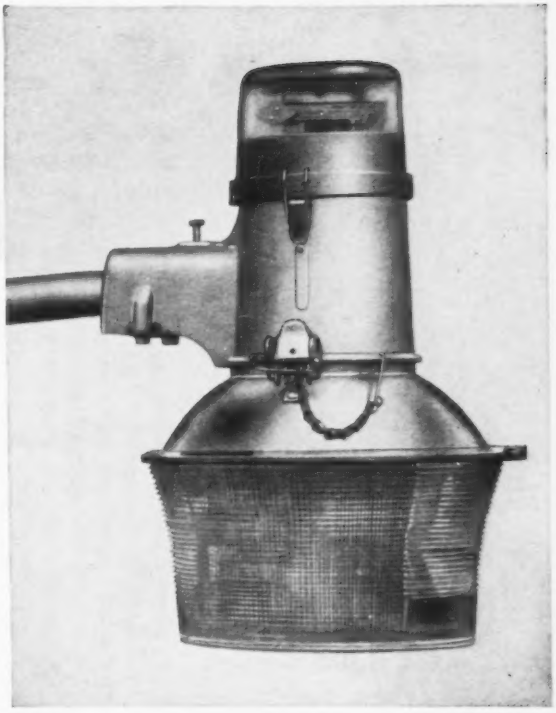
L-M Suburbanaire Gives Protection, Adds Off-Peak Load

Utilities rent customers this photocell-controlled luminaire at about $3 a month; it provides all-night lighting for security and recreation; increases revenue for the utility. Open-type refractor keeps maintenance at minimum.



A number of utility companies have had excellent results with a new plan for individual outdoor lighting for customers. Here, briefly, is the plan:

- The utility installs the L-M Suburbanaire on the customer's premises without charge. The Suburbanaire is an open-type, low-cost luminaire with built-in photocell control, thus providing all-night yard lighting.
- The utility maintains the unit and keeps it in operation.
- The utility provides power which does not go through the customer's meter.
- Cost to the customer is a stated amount per month—usually $3 or $3.50—which covers all costs. The utility retains ownership of the luminaire.

Customers like the plan, because it safeguards property, cuts vandalism and theft, reduces accidents, and has some prestige value, particularly in areas where there is no street lighting.

From the utility standpoint, the plan increases revenue in off-peak hours. Here is what some utility men say:

"We have installed more than 200 L-M rural lights, increased our off-peak load by more than 50 kw, and have had many expressions of complete satisfaction from our customers."

"The Photocell Suburbanaire assures us of an off-peak load of about 1000 kw hours per unit. We have installed almost 400 Suburbanaire luminaires, many of these replacing the old makeshift radial fixture arrangement. Customer reaction has been excellent . . . equipment and gasoline theft has dropped substantially and vandalism is almost nil."

"From time to time, customers have asked us for outdoor lighting for rural and suburban homes. Since January, 1957, we have been installing L-M's new Suburbanaire unit. The long-life lamp and photo-electric cell, plus ease in relamping and cleaning the open refractor, will keep our maintenance costs at a very low minimum. This makes it possible to offer this service at a very low cost."

TYPICAL ANALYSIS OF COSTS

Material:	
Suburbanaire, photocell, bracket, etc.	$ 70.00
Installation labor	30.00
Annual power cost (based on 300 watt lamp burning 4000 hrs. per year @ 1¢ kwh)	12.00
Lamp replacement, maintenance	9.00
Total Cost First Year	**$ 121.00**
Outdoor lighting equipment is built to last 20 to 25 years, but if this equipment is amortized over 10 years, the cost will be:	
First-year cost (above)	$121.00
Nine times power and maintenance cost (9 more years) 9 x ($12 + $9)	189.00
10-year total	$310.00
Interest at 6%	18.60
Profit, at 10% on $328.60	32.86
Total 10-Year Cost Plus Profit	**$ 361.46**
Annual cost (1/10th)	$ 36.15
Cost per month (1/12th)	$ 3.01

Get The Whole Story

Ask the L-M Field Engineer for bulletin on the L-M Suburbanaire luminaire and more information on the profitable customer-rental plan. Or write Line Material Industries, Milwaukee 1, Wisconsin. In Canada: Canadian Line Materials, Ltd., Toronto 13, Ontario.

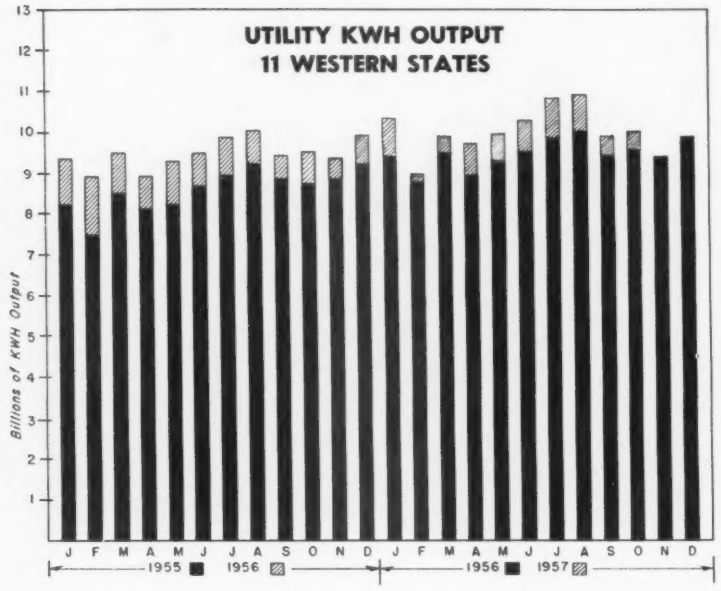
McGRAW-EDISON

316

LINE MATERIAL Industries Outdoor Lighting

McGRAW-EDISON COMPANY

----How're We Doing?



Output Comparisons

Year-to-year Kwh Output Changes in Western Regions and U. S.
Per Cent Changes Over Same Week One Year Ago

Week Ending	Rocky Mountain	Pacific Southwest	Pacific Northwest	U. S. Total
Dec. 7	+ 2.1	+ 4.7	— 2.5	+ 2.2
Dec. 14	+ 2.8	+ 5.9	— 2.3	+ 2.9
Dec. 21	+ 4.9	+ 5.4	+ 2.5	+ 1.5
Dec. 28	+ 4.7	+ 5.6	— 1.6	+ 0.2

Slide

The rate of growth of kwh output has slackened off, reflecting the drop in industrial power demand. Unemployment is crowding the 4,000,000 figure. Heavy construction awards took a sharp downturn in the late days of 1957 as December volume dropped 22% below November and 39% below a year ago. . . The dip, however, did not keep last year from reaching an all-time high with a record construction expenditure of $47.2 billion. Better still, 1958, according to Department of Commerce forecasts as late as mid-January will even top this with a predicted $49.6 billion construction outlay. This increase will come mainly from housing and highway construction.

Whoppers

Outsize new projects for the West made news last month. In the Los Angeles area, Century City, a new skyscraper complex of 20-story buildings (the height limit has been increased) will cost $400,000,000. . . The long-awaited Lloyd Shopping Center along Sullivan's Gulch in Portland will be bid this month with an estimated cost of $25,000,000. . . Other large jobs included a $9,000,000 550-unit duplex and garden apartment project for Hamilton Air Force Base (Calif.); a $10,000,000 hotel and office building for San Francisco; and a $6,000,000 office building for Public Service Co. of Colorado in Denver.

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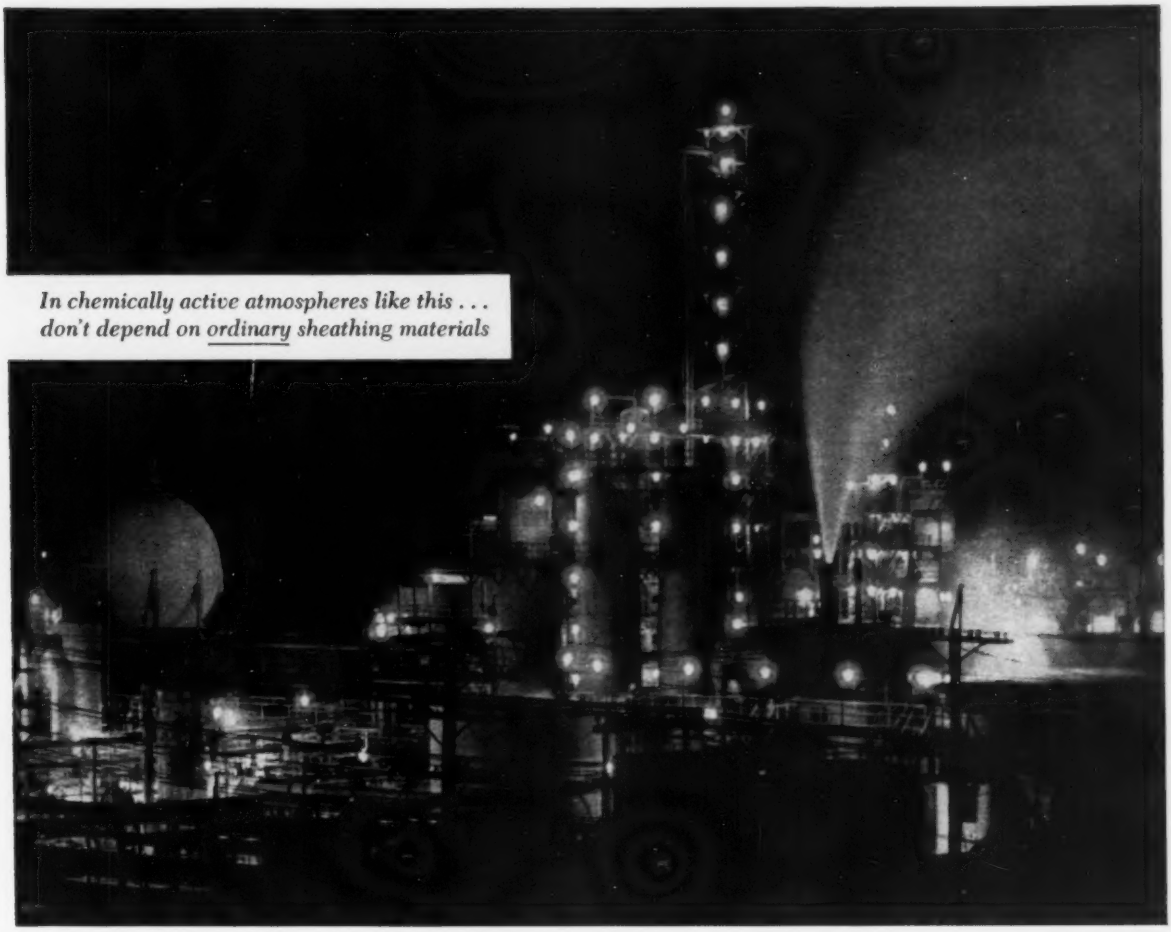


In chemically active atmospheres like this . . . don't depend on ordinary sheathing materials

Continuity of power service often demands corrosion-resistant cable sheaths . . . like Roseal

What happens when your power cable in a refinery, steel mill, paper mill, or chemical processing plant fails from the deterioration caused by a highly corrosive atmosphere? You pay to replace the cable, your customer complains about downtime, and most important—*you lose power revenue.*

Now you can avoid power service interruptions in areas like those where the increased likelihood of cable breakdown presents a real problem. A new flame-retardant polyethylene compound—developed by Rome Cable—provides the kind of protective sheath you need in critical areas with oxidizing and corrosive atmospheres.

Tough new sheath

Called *Roseal,* this new sheathing compound makes long, uninterrupted service possible where heat, oils, acids, most chemicals, moisture, and oxidizing and corrosive atmospheres exist. Here's why:

1. Roseal resists oils, moisture, and most chemicals *even better than conventional nonmetallic sheathed cables.*
2. Its moisture-resistant characteristics are superior *to all other types of nonmetallic sheaths.*
3. Its flame retardance meets UL original horizontal flame-test requirements.

Low-cost dependability

As an added benefit, in addition to its excellent properties, Rome's Roseal generally costs less than thermosetting sheaths. Roseal-sheathed cables are available with either aluminum or copper conductors and many types of insulations, including Rome's ozone-resistant oil-base (Rozone) or butyl-base (Rozone A) insulations. You can get single-conductor Roseal-sheathed cables in a variety of sizes from No. 8 AWG to 1,000 MCM, with grounded or ungrounded neutral, in standard voltage ranges from 3 to 15 KV.

For more information, contact your nearest Rome Cable representative—or write to Department 718, Rome Cable Corporation, Rome, New York.

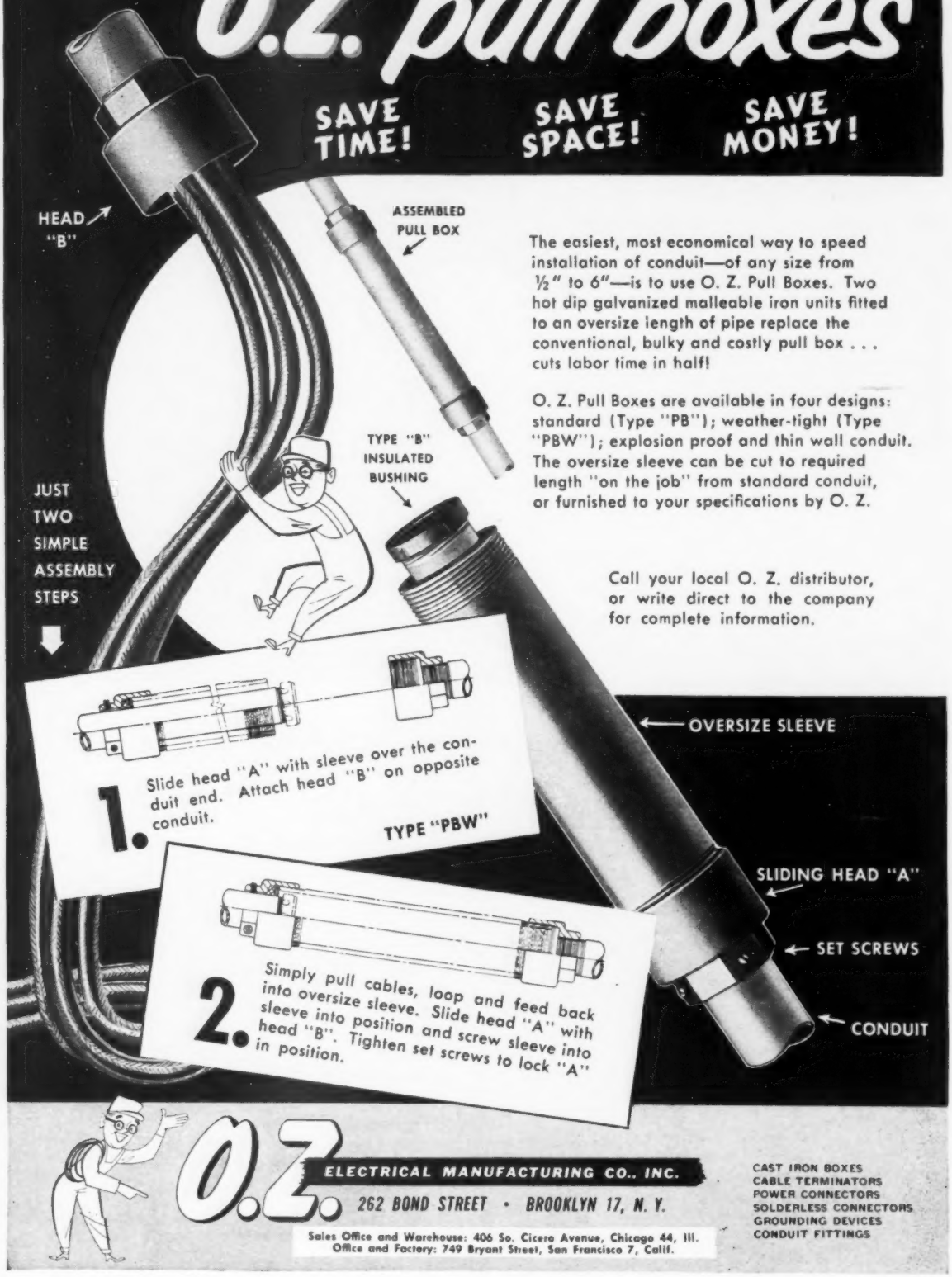
FREE: New Technical Bulletin—describing in detail Rome's shielded high-voltage power cables—sheathed with thermoplastic Roseal—is now available. Just write for Bulletin RCD-700.

ROME CABLE

CORPORATION

O.Z. pull boxes

SAVE TIME! SAVE SPACE! SAVE MONEY!


HEAD "B"
ASSEMBLED PULL BOX
TYPE "B" INSULATED BUSHING
JUST TWO SIMPLE ASSEMBLY STEPS
OVERSIZE SLEEVE
SLIDING HEAD "A"
SET SCREWS
CONDUIT
1. Slide head "A" with sleeve over the conduit end. Attach head "B" on opposite conduit.
TYPE "PBW"
2. Simply pull cables, loop and feed back into oversize sleeve. Slide head "A" with sleeve into position and screw sleeve into head "B". Tighten set screws to lock "A" in position.

The easiest, most economical way to speed installation of conduit—of any size from ½" to 6"—is to use O. Z. Pull Boxes. Two hot dip galvanized malleable iron units fitted to an oversize length of pipe replace the conventional, bulky and costly pull box . . . cuts labor time in half!

O. Z. Pull Boxes are available in four designs: standard (Type "PB"); weather-tight (Type "PBW"); explosion proof and thin wall conduit. The oversize sleeve can be cut to required length "on the job" from standard conduit, or furnished to your specifications by O. Z.

Call your local O. Z. distributor, or write direct to the company for complete information.

O.Z. ELECTRICAL MANUFACTURING CO., INC.
262 BOND STREET • BROOKLYN 17, N. Y.

Sales Office and Warehouse: 406 So. Cicero Avenue, Chicago 44, Ill.
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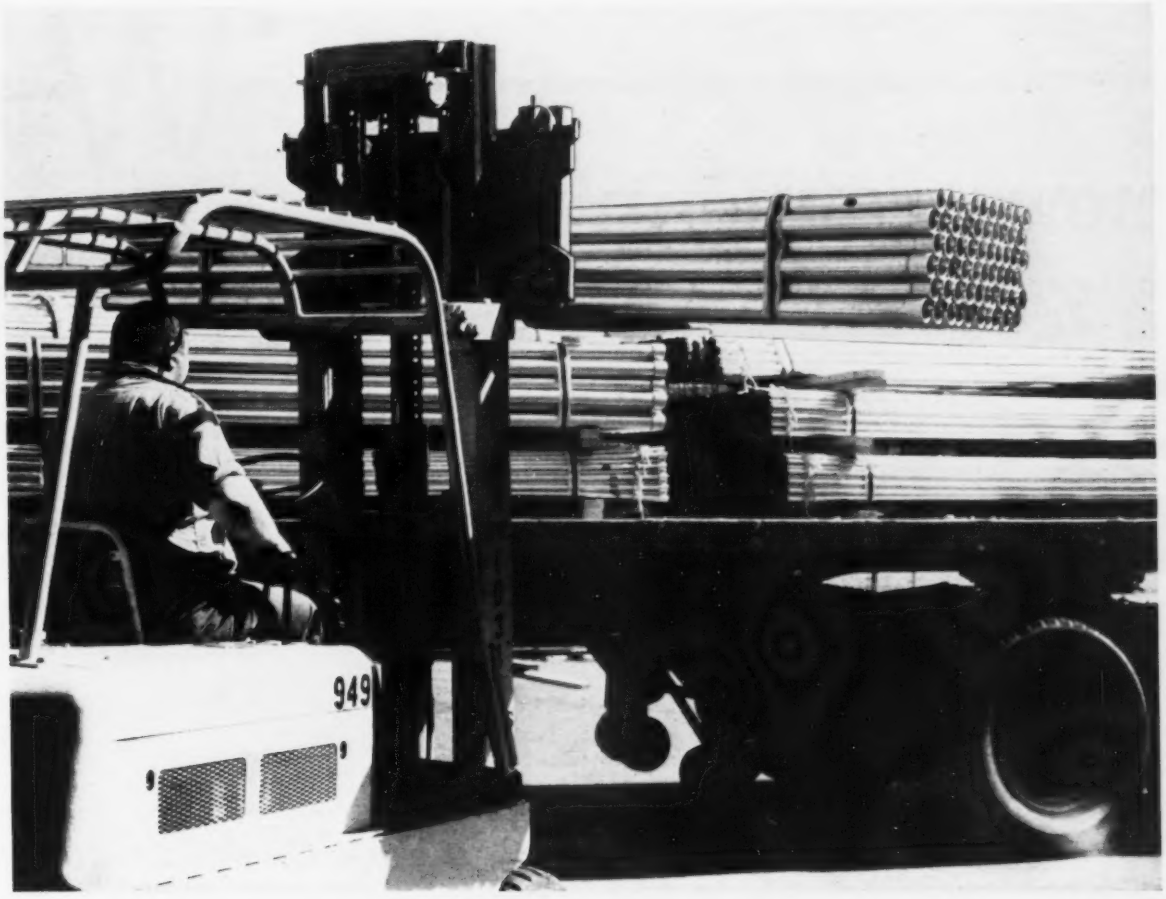
CAST IRON BOXES
CABLE TERMINATORS
POWER CONNECTORS
SOLDERLESS CONNECTORS
GROUNDING DEVICES
CONDUIT FITTINGS



Cut your EMT and rigid handling costs 50% with Rome's quick-stacking strapped bundles

Don't waste costly man-hours unloading and stacking EMT or rigid conduit by hand.

Instead, order your EMT and rigid conduit from Rome in these convenient strapped bundles. You can handle them in your warehouse—at *half the cost* or less—with a fork lift or crane.

Easy to store and handle. Uniform bundles, separated by 2 x 4 lumber, can be worked from either side by fork lift or crane.

Why they're faster

You know how many man-hours it takes to unload a truck or trailer of small bundles of EMT or rigid—*too* many! The same goes for big shipped-by-sea pallets if you buy conduit that way. The big bundles have to be broken down into hundreds of little ones.

What a difference with Rome's strapped bundles! One man with a fork lift or crane can unload and stack a 20-ton truck or trailer load in *just 30-40 minutes.*

Each bundle contains a uniform quantity of smaller bundles, for easy handling on the job site.

Here are three more ways you save with this convenient Rome package:

1. Less damage risk. The securely strapped bundle protects your EMT and rigid conduit en route to you and while you're storing it.

2. More efficient storage. Rectangular shape of each bundle makes stacking easier, neater and more compact.

3. Faster counting. You can take physical count of your inventory in a few minutes, because bundles are uniform.

To get these advantages, specify Rome's EMT and rigid conduit in strapped bundles. Contact your Rome Cable representative for more information—or write to Department 904, Rome Cable Corporation, Rome, N. Y.

ROME CABLE

CORPORATION

news roundup

IKE'S SCHOLARSHIP PLAN HIT—The National Society of Professional Engineers added a solid blow to many already falling on President Eisenhower's proposal for 10,000 undergraduate scholarships for the next four years. A spokesman for the society pointed out that the scholarship program will create additional burdens for colleges already struggling financially, and will place the wrong emphasis on the engineering-scientific manpower problem.

Dr. Clark A. Dunn, vice-president in charge of educational matters for the 43,000-member society and director of the Engineering Experimental Station at Oklahoma State University, said the Administration plan . . . "will complicate and aggravate an already serious situation in the colleges."

The meat of the problem, many point out, is that colleges need new plants and equipment as well as aid in offering substantially higher salaries to faculty members.

Sort of makes you wonder.

—EW—

We should live so long—to see electric heat taken up seriously by the industry. So much so that Ebasco Services is conducting an electric space heating school in New York City to train new heating representatives in utility sales departments. The course is also offered as a refresher course for experienced men who have rusted from inaction. It runs from Jan. 27-31.

—EW—

THE "BRAIN WORKS"—R. H. Travers of the Ohio Edison Co., presenting a paper entitled "Operating Experience With GEDA Automatic Economic Dispatching—Ohio Edison System," stated that . . . "The power dispatch computer has been supervising the automatic control of the system most of the time, and has enabled the dispatchers to perform their duties in a more efficient manner.

Actual savings in dollars are very difficult to evaluate, and such evaluations as have been made indicate that our original estimates that the computer would pay for itself in two years will be realized."

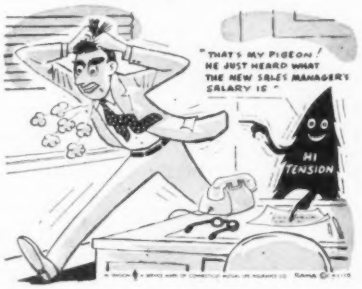
—EW—

To millions of workers this is a clock-eyed world.

—EW—

Santa Claus is in many guises, apparently. Utah Power & Light Co. gives free electricity for some 50,000 holiday lamps in streets and parks along the company's distribution lines each year. The gift service is available to 116 cities and towns in the company's service area, from Dec. 1 to Jan. 1, and last year consumption amounted to 272,840 kw.

Get Off the Worry-Go-Round



Envious Ed

Look at Ed! How can he do his job if he lets envy strangle him. Think of the nervous energy this man uses worrying about what someone else is getting paid. Envy never increased anyone's salary.

Ed ought to be honest with himself, try to face up to his own frustrations and do something about them. For only frustrated people are envious of others. Let Ed look to himself.

Put all you've got into your work. You'll get a kick out of working at the top of your ability. Your life is for yourself; make the best of it. You'll have something no one can take away from you.

TWO-IN-ONE—A new combination circuit breaker and outlet all in one, offering both circuit wire and convenience outlet protection, is coming out soon.

Federal Pacific Electric Co. announces, along with details of a new Stab-Lok 100-amp breaker, that the unit permits converting any of the company's load centers into a main disconnect panel.

Sixteen new fusible panels and a new plug-in type StABreaker of 240- and 600-v a-c are also announced in a new brochure.

Versatility and flexibility to meet almost any combination of requirements in panels with standard enclosures and these interchangeable devices is made possible.

—EW—

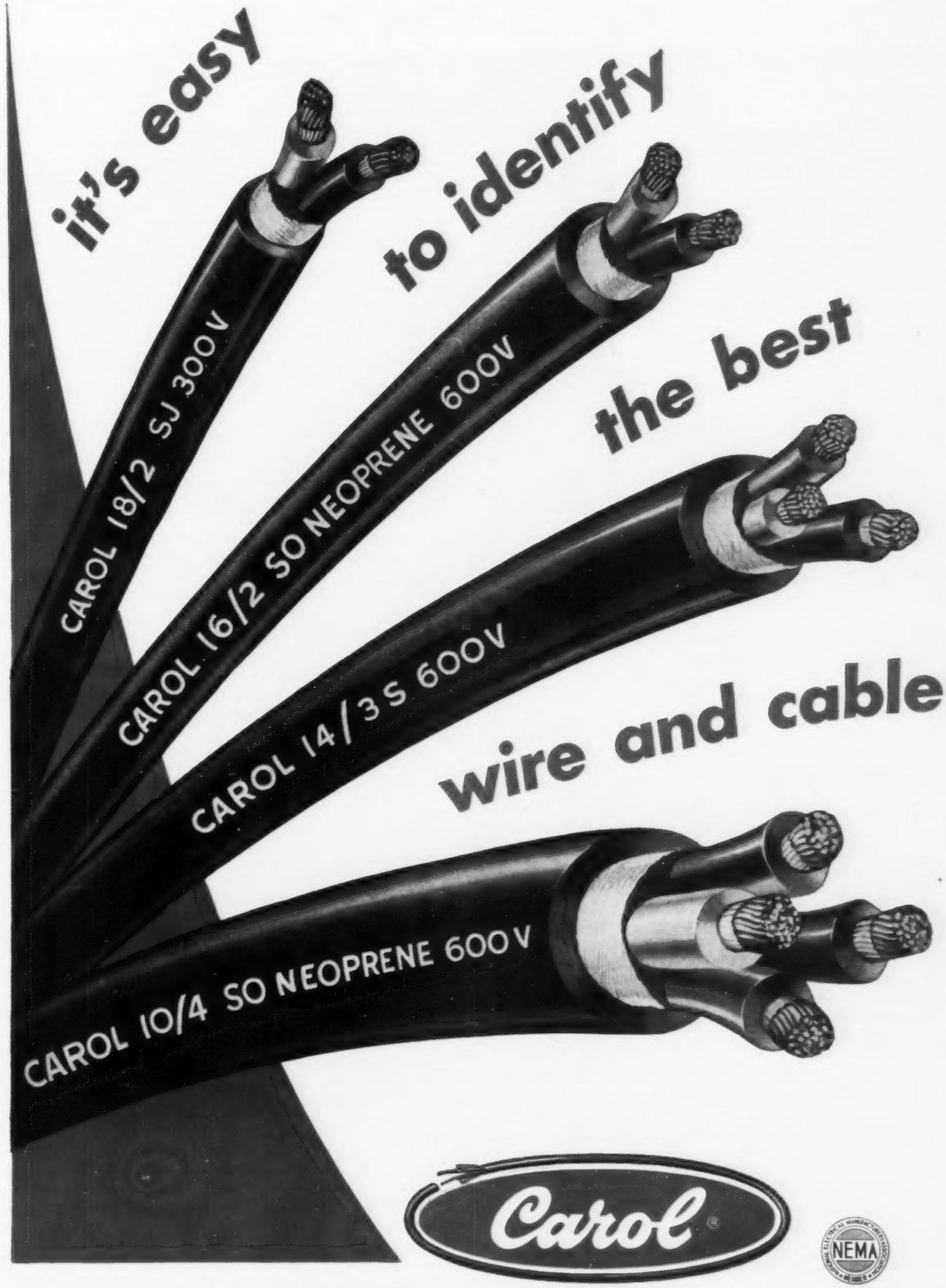
W. V. O'Brien, vice-president and general manager of General Electric's Apparatus Sales Division, is new president of the National Electrical Manufacturers Assn. He succeeds A. A. Berard of Mt. Vernon, N. Y.

—EW—

You can either buy or borrow the new Westinghouse film on adequate wiring entitled A Family Affair. *Reports are that the company has gone all-out to use top talent and photography to tell a convincing story about a typical middle-class family and their low housepower problems. The stars are Eddie Albert, Marjorie Reynolds and Bobbie Driscoll. Write to: Film Library, Westinghouse Electric Corp., Gateway No. 3, Pittsburgh 30, Pa. Attention: R. A. Roxas.*

—EW—

GOOD-BYE PRIVACY—William J. Morlock, general manager of General Electric's technical products department, has announced that a system for transmitting pictures for conventional telephone lines has been successfully demonstrated to the military services. In other words,



CAROL CABLE COMPANY • Division of the Crescent Company, Inc., Pawtucket, R.I.

• Portable Cords • Cordsets • Lamp Cords • Welding Cables • Thermostat Wires • Power Supply Cables

the day of televised telephone calls is almost here.

With this development, no doubt, will also come three shaves a day, pastel colored shirts, haircuts twice a week and many hours of practice before a mirror.

—EW—

John J. Flaherty, assistant to the general manager of Atomics International and formerly manager of the Atomic Energy Commission's Chicago operations office, will receive AEC's outstanding service award as recognition for superior performance while an employee of the commission.

—EW—

PRAISE—Westinghouse Electric Corp. has recently received commendations from the U. S. Navy's Bureau of Ships and also from the Joint Congressional Committee on Atomic Energy.

The praise was earned by the company's work on the first full-scale atomic power plant at Shippingport, Pa., and for its "excellent performance to date" in its work on propulsion plants for two additional nuclear subs, the U.S.S. *Swordfish* and U.S.S. *Sargo*.

The commendation was also for Westinghouse work that enabled the Navy to launch the nation's third atomic submarine, the U.S.S. *Skate*, six months ahead of schedule.

—EW—

Formula for failure: Try to please everybody.

—EW—

"Industrializing the Atom" is the slogan of the 1958 Nuclear Congress, which is to be held March 17 through 21 at the International Amphitheater in Chicago.

—EW—

CONFERENCE—"Plastics in Building Illumination—Daylight and Electric Sources" will be the topic of a conference in Houston, Tex., staged by the Building Research Institute.

The institute, which seems to be devoted to plastics in building, is making illumination the subject of its first major meeting. It will be held at University of Houston, March 5-6.

Divided in three parts the first will deal with the objectives of building illumination; the second with plastics applications for lighting; the third with future potentials from new plastics light transmitting products now in development. Speakers will be drawn from both the lighting and the plastics industries.

—EW—

REFERENCE—Portable equipment grounding rules from the National Electrical Code have been compiled together in a series of loose-leaf sheets, for insertion in standard binders, by Harvey Hubbell Inc. for distribution to those interested.

Explanation of the new standard designs of receptacles for the various voltage systems is given on the cover.

Excerpts from the IAEI News-Bulletin pertaining to grounding plugs and receptacles are also included.

—EW—

An ELECTRICAL WEST *editor, attempting to set up for a difficult photograph, became discouraged after a decided lack of success. As he collapsed his tripod, he mumbled, "The hell with it. Let somebody write* 10,000 *words."*

Rescue Heroes Decorated

Brigadier General Louis H. Foote presents the Soldier Medal to Colonel Jackson Graham and the Air Medal to Wesley G. LeMatta, a Portland helicopter pilot, for the parts they played in the rescue of crew members of a dredge that went down at Coos Bay last September. LeMatta and Colonel Graham were on an aerial inspection tour when they saw the dredge in trouble, and quickly devised rescue operations

POPULAR—Employee publications are big business. 8,000 U. S. companies spend $500,000,000 a year to produce 300,000,000 copies.

Electric utilities, apparently staunch supporters of this method of employee communications, produce some of the finest examples of the art in the country.

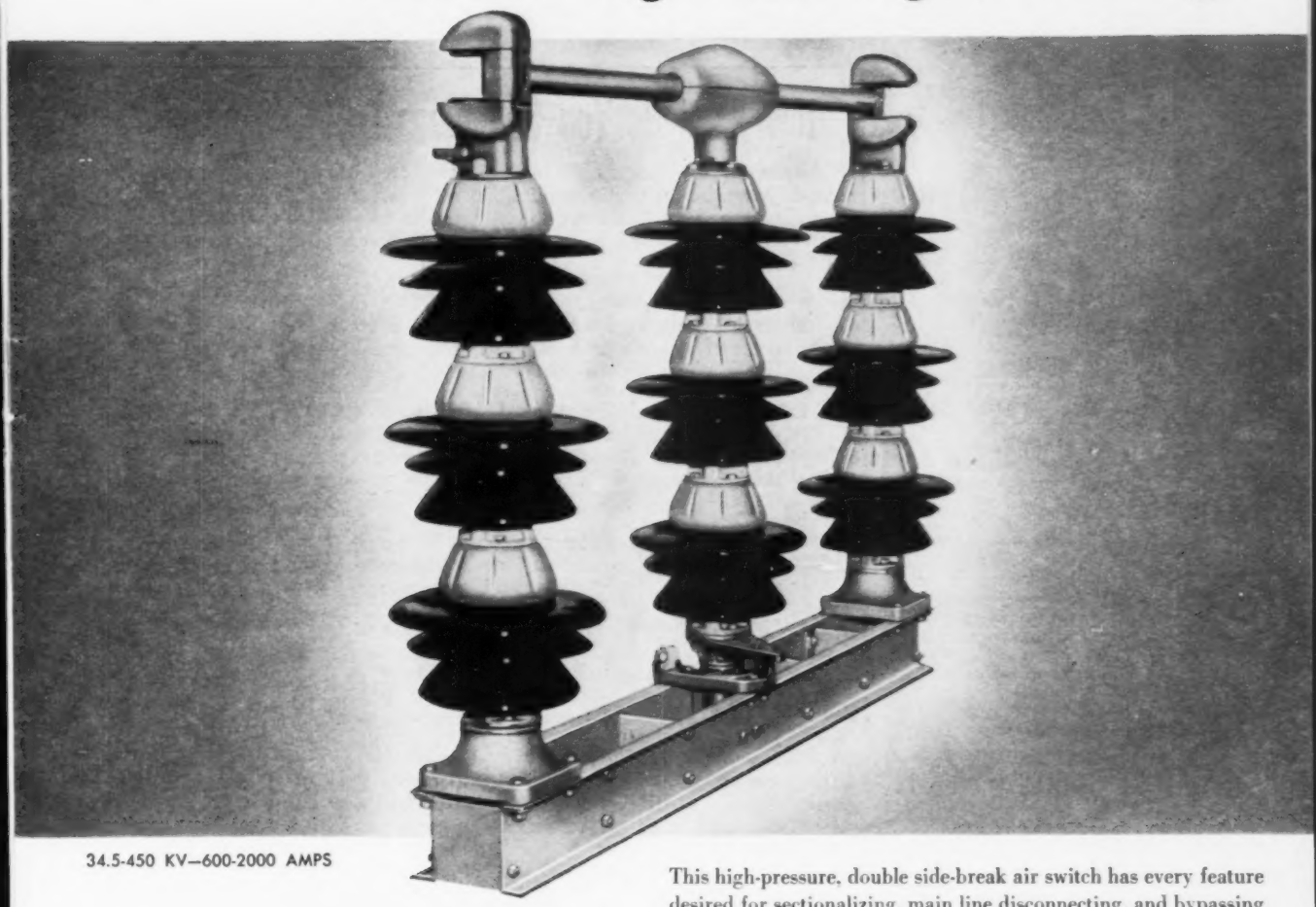
Managements that feel they could improve their own respective employee publications might be interested in the new booklet "Better Business Relations Through Employee Publications," produced by the Chamber of Commerce of the United States in Washington, D. C. Send 50c if you want a copy.

—EW—

GIANT—The world's biggest electric light has been installed by Federal Sign & Signal Corp. atop Wilshire Oil Co.'s 20-story high catalytic cracker. Generating 500,000,000 candle power, the light is visible in a 40-mile radius in the Los Angeles area. From the air it can be seen from 300 miles away, and the Civil Aeronautics Authority intends to show it on all its charts as an aid to air navigation.

Powered by a specially built 2,500-w short arc mercury vapor discharge lamp only 13 in. in height, the giant

Southern States' streamlined RDC offers 5 big advantages in design



34.5-450 KV—600-2000 AMPS

This high-pressure, double side-break air switch has every feature desired for sectionalizing, main line disconnecting, and bypassing service in substations and on transmission lines. In addition the RDC has five outstanding advantages in its design:

1. Low silhouette in the open position permits application where vertical clearance prohibits the use of vertical-break switches.
2. Switch blade is completely dead in open position. Phase spacing is less than required for single side-break switches.
3. Horizontal breaking permits lower zone of protection against lightning, with corresponding savings in steel structures.
4. Smooth, corona-resistant contours result in RIV of less than 500 microvolts.
5. One-piece blade is balanced in all positions, reducing stress on moving parts. No blade balancing mechanism is required.

Your Southern States representative will be glad to give you complete details. Or write direct for Bulletin 57 RDC.

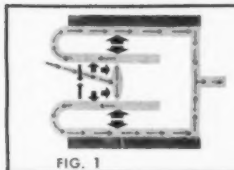


FIG. 1

CUTAWAY VIEW

***Amplitact*® Contacts on RDC**

High pressure Amplitact contacts provide maximum dependability under high current short-circuit conditions. The arrows in Fig 1 show direction and relative magnitude of electromagnetic forces induced when switch is subjected to fault current.

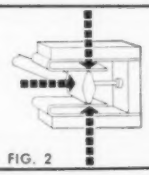


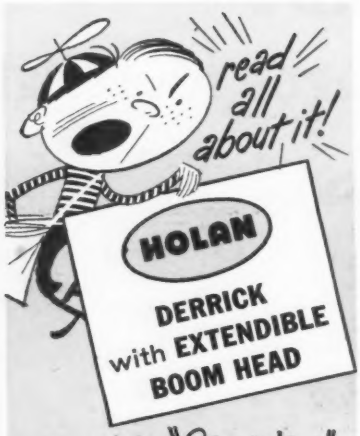
FIG. 2

The resultant ELECTRO-MAGNETIC forces, as shown by arrows in Fig 2, greatly increase contact pressure and positively hold blade in engaged position.

SOUTHERN STATES
EQUIPMENT CORP.
HAMPTON, GEORGIA

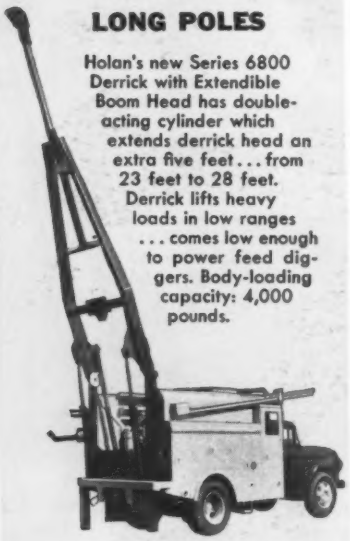
IN CANADA: Dominion Cutout Co., Ltd., Toronto

LIVE BETTER ELECTRICALLY



DERRICK "Stretches" TO HANDLE LONG POLES

Holan's new Series 6800 Derrick with Extendible Boom Head has double-acting cylinder which extends derrick head an extra five feet... from 23 feet to 28 feet. Derrick lifts heavy loads in low ranges ... comes low enough to power feed diggers. Body-loading capacity: 4,000 pounds.



Send coupon for technical data.

J.H. HOLAN CORPORATION
4100 WEST 150TH STREET
CLEVELAND 11, OHIO

OTHER PLANTS: GRIFFIN, GA.; PHOENIX, ARIZONA; BRANTFORD, ONTARIO

To J. H. Holan Corporation
4100 West 150th Street
Cleveland 11, Ohio

Please send me complete technical information about Holan's Series 6800 Power Derrick.

Name_____ Title_____
Company_____
Address_____
City_____ Zone_____ State_____

searchlight utilizes a quartz bulb that is designed to withstand the 1,500 F heat and the extreme (300 lb per sq. in., internal pressures of the beacon. The lamp was built by Westinghouse.

Despite its two-ton weight, the light is only 5 ft in diameter, and is so delicately balanced that an electric motor of only 1/3 hp is required to turn the beacon one complete revolution every 62 seconds.

How Well Do You Sell Ideas To Management?

Success in selling ideas has been demonstrated to require certain skills and attitudes. A group of administrative men who have been successful in this technique have found agreement in answering these questions. Why not see how you come out? See page 96 for answers.

	True	False
1. Oral reports, except in unusual circumstances, are preferred as a means of conserving time of both the manager and the subordinate.	.....	.....
2. Superiors should be grateful that I come up with new ideas and not expect complete filling-in on all the possible hindrances or disadvantages which might turn up if management adopted my suggestions.	.....	.....
3. I don't think my superior needs or wants to be bothered with reports and details as long as everything is running smoothly in my department.	.....	.....
4. If I have a good idea, I shouldn't have to worry about timing it just right. Management should have the imagination to see how good it is without my having to sell it, or to couch it in their terms, or to wait for the right moment to spring it.	.....	.....
5. Submitting too many ideas and suggestions about operating outside my own department might antagonize other department heads, tag me as a meddler and make my superior wonder if I'm doing my own job right.	.....	.....
6. I believe that extensive use of audio-visual aids rather than a clear, concise statement of facts, is the best way of putting ideas across to superiors.	.....	.....
7. It is better to throw out to the boss a series of suggestions out of which he can indicate those he wants worked up, than it is to present one or two completely worked out ideas or recommendations.	.....	.....
8. My boss gives the impression that he is too busy to be bothered by sitting down and studying new ideas.	.....	.....
9. Once I present an idea I either don't hear about it again or, if I do, somebody else has gotten credit for it.	.....	.....
10. On the theory that management likes to draw its own conclusions, it is better to submit ideas in a factual form rather than to try to interpret them for the higher-ups.	.....	.....
11. In presenting a plan for action, it is better to come up with a single well-thought-out recommendation than to suggest several alternative possible courses of action.	.....	.....

DURABLE—Wrought iron stands up far better in corrosive locations.

Until recently no wrought iron conduit had been tested and listed by Underwriters' Laboratories for use as electric raceway. Now it has. And National Electric Products Corp. offers a booklet on the subject.

It tells why wrought iron stands up better—also how it is sherardized. Data on dimensions and weight, wire fill with various types of wire and cable and similar working information are also included.

—EW—

All of its circline fluorescent lamps will hereafter be made of the rapid start design, Westinghouse has declared. Most of such lamps are used in home lighting units and instant starting is a desirable feature. The lamps will also work on existing preheat ballasts.

—EW—

RECORD?—Twenty months and two days after Portland General Electric and Guy F. Atkinson Co. signed the construction contract for the $25,000,000 Pelton Dam on the Deschutes River, power was supplied to PGE customers. Sounds like a record.

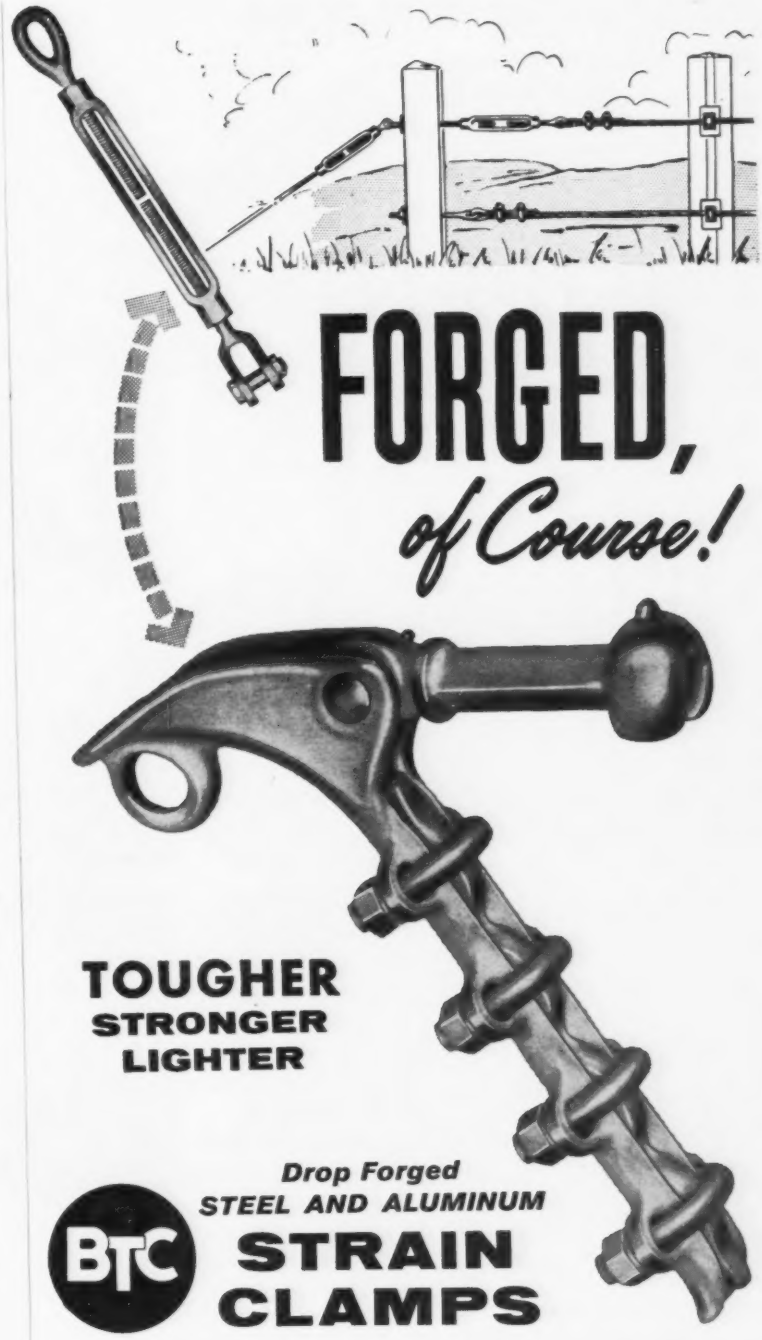
The Pelton Dam is the thinnest of its height ever built in the U. S. High strength concrete tapers from 26½ ft at the base to 8 ft at the crest. Resultant savings—$3,500,000.

—EW—

General Electric Co. announces that it has accomplished a 9% increase in the light output of its 40-w standard cool white fluorescent lamp. The increase is attributed to a new manufacturing process, which will be applied in the near future to other G-E white fluorescent lamps.

—EW—

More than 1,000,000 kwh of electricity have been produced by the atomic electric power plant of General Electric Co. and Pacific Gas & Electric Co. The electricity is fed into the PG and E system for use in northern and central California, and believe it or not PG and E men have had housewives say to them, "I don't want any of that atomic electricity in my house."



Electrical West Authors

Progress comes from many different things, and among the most important is a free exchange of ideas, technology and experiences on the part of the people in the electrical industry. Recognition for active participation—"for contribution to the literature of the industry"—has been earned by the men shown here.

President Paul McKee, left, Pacific Power & Light, presents plaque to Wallace A. Forsman, Robert de Luccia looks on

James Ashurst, left, receives his plaque from Lester Gamble, chief engineer of Washington Water Power

Ivan Bateman, center, assistant manager, Los Angeles W&P, awards plaques to R. J. Schonborn, left, and F. B. Hyde

E. C. Neff, left, and Paul Nelson receive plaques from W. L. Chadwick, vice-president, engineering, of Southern California Edison

Ray Pollard, left, and George Dickson, authored article. A. L. Pollard, operating manager, Puget Sound P&L, presented

J. C. Boyle, vice-president, chief engineer and general manager of California Oregon Power, presents plaques to L. M. Stinson, top, and L. S. Horton

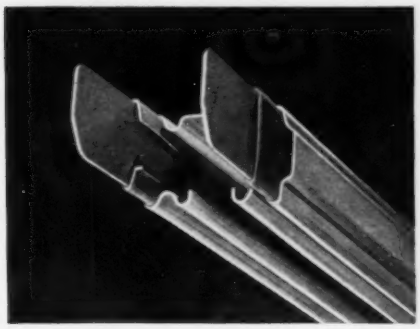
H. A. Noble, right, vice-president of operations, San Diego Gas & Electric, presents to J. B. Bowen, author

New Universal Lighting System—

for flexible, low-cost lighting

Specify efficiency and economy, too. BullDog's new 20-amp Universal Lighting System both feeds and supports lighting fixtures . . . requires no supplementary fusing. Fixtures can be positioned at any spot throughout the entire system . . . are quickly and easily moved to meet changes in lighting requirements. No rewiring or electrical downtime, either.

Listed by Underwriters' Laboratories, this new Universal Lighting System assures maximum flexibility at minimum cost. Check its many advantages. Consult your electrical distributor or BullDog field engineer. Or write BullDog Electric Products Co., Detroit 32, Michigan. © BEPCO



CROSS SECTION of new, low-cost 20-amp Universal Lighting System. Movable weight supports and twistout plugs speed rearrangement, addition or removal of fixtures, eliminate rewiring and electrical downtime.

BULLDOG

BullDog Electric Products Co., Detroit 32, Mich. A Division of I-T-E Circuit Breaker Co.
BullDog Export Division: 13 East 40th St., New York 16, N.Y.
In Canada: BullDog Electric Products Co. (Canada) Ltd., 80 Clayson Rd., Toronto 15, Ont.

Consult the following Pacific Coast representatives:

Coast Electric & Manufacturing Co.
1733 N.E. Seventh Avenue, P.O. Box 7712
Portland 12, Oregon

Young Electric & Mfg. Co.
2134 Curtis St.
Denver 2, Colorado

Safety Switchboard Company
910—89th Avenue
Oakland 21, California

BullDog Elec. Prod. Co. of Los Angeles
2885 E. Washington Blvd.
Los Angeles 23, California

Observing NATIONAL ELECTRICAL WEEK

How many generators to

produce 24,000,000 kw ?

About 22,000—so far. That is the number of generators Electro-Motive has built during the past twenty years, for a total generating capacity of more than 24,000,000 kw.

As a leading manufacturer of electrical equipment, Electro-Motive has not only produced thousands of generating units, but in the process, has also contributed materially to "improving the breed." Electrical engineers at Electro-Motive are continuously experimenting with new design improvements, new processes that result in more efficient, longer-lived units.

It is this background of experience in production, design and research that stands behind Electro-Motive power equipment. It is your assurance of dependability, economy and long life under the difficult applications of low load factor generation for which they were designed. Why not ask your Electro-Motive representative for additional information?

1000 kw units for use on sidings or placed on piers for semi-permanent use.

500 kw units offer excellent mobility for many temporary applications.

LIVE BETTER ELECTRICALLY

ELECTRO-MOTIVE DIVISION
GENERAL MOTORS
LA GRANGE, ILLINOIS
Sales offices in Chicago, New York, St. Louis, San Francisco
In Canada: General Motors Diesel, Limited, London, Ontario

Compare—

the Appearance of National Electric Xduct Junior, E.M.T.

You'll see the difference immediately! A bright, attractive silver finish that makes Xduct Jr. ideal for exposed-to-view installations. This outstanding finish results from the addition of a special brightening agent that gives each length of Xduct Jr. not only its brilliant luster, but years of corrosion resistance. New on the outside . . . new on the inside—specify National Electric Xduct Jr., E.M.T.

it's **NEW** on the inside...
NEW on the outside

Outstanding holding action, vibration resistance
NE Couplings

National Electric E.M.T. Fittings are safe and strong because of the sturdy one-piece pressed steel body and outstanding holding action of the patented NE embedding screw.

A screwdriver is all that is needed to install National Electric E.M.T. fittings. Try them . . . they are sold by leading electrical distributors everywhere.

NATIONAL ELECTRIC PRODUCTS
NE
WIRING 6 SYSTEMS
WIRES AND CABLES

National Electric Products

PITTSBURGH, PA.
2 Plants • 12 Warehouses • 41 Sales Offices

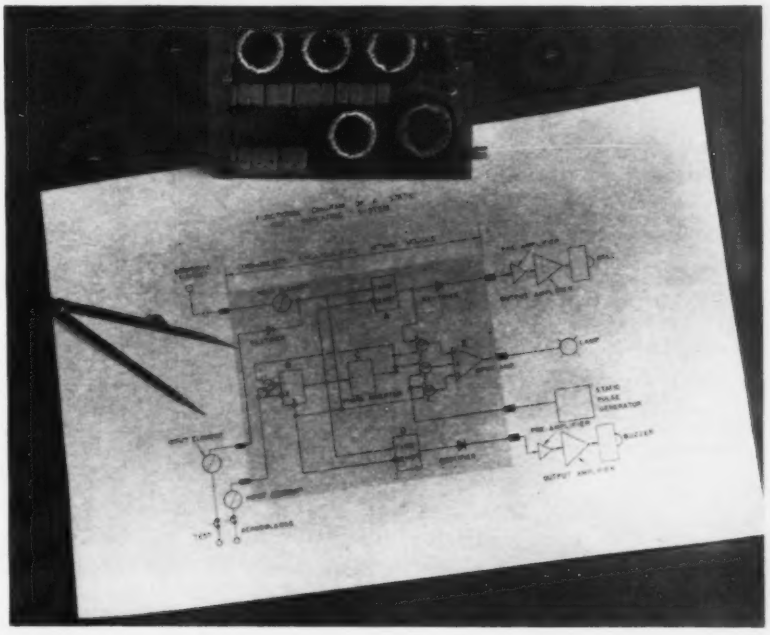
PRODUCT NEWS

New Designs and Applications

Annunciator System

(1) *Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.*

An annunciator system with no moving parts for utility generating stations will get its first application this year. It will monitor 560 critical quantities in a new 580,000-kw power plant in New Jersey. The system will use modular plug-in magnetic elements rather than relays. In overall design it will be similar to Cypak static control systems for industrial control applications, but circuit components are different. The static annunciator systems house several information processing components in a single plug-in module, whereas standard Cypak industrial control systems require several modules. Reported advantages of the new annunciator system center on the extreme long life and reliability of magnetic elements, but its designers list others of significance. They include better testing—pressing a single button puts all of the logic elements in an 80-point system through a complete cycle, including the lamps, bell and buzzer; low-power requirements —1 w per monitor point on stand-by, 8 w when lamp is lighted; and inherent "memory," which enables the equipment to resume proper induction after a power outage. Also included are electrical isolation of monitor signals, the ability to function over a voltage range of 75 to 140 v, and the ability to convert the system for normally open or normally closed operation simply by installing a different control module.



Circuit Breaker

(2) *Federal Pacific Electric Co., 50 Paris St., Newark, N. J.*

A 400-amp molded case circuit breaker that is 5⅞ in. shorter than similarly rated breakers now in use has been announced by this company. The new unit covers applications presently using J-, K-, and KL-frame sizes. Its use results in space savings up to 30% in panelboard, switchboard and electrical machinery components, according to the manufacturer.

Fish-Line Gun

(3) *Jet Line Gun Co., 730 Seigle St., Charlotte, N. C.*

This company announces availability, through Graybar Electric Co., of a new "gun" that shoots line through conduit in seconds. A packaged spool of nylon line is attached to a sealed cartridge of liquified gas which, in turn, is then muzzle-loaded into the gun. After insertion into the conduit, a trigger actuates a firing pin, puncturing a hole in the cartridge. Gas propels the cartridge through the conduit at high speed, laying the line behind it. The company announces that effective distances of 400 ft in straight runs can be attained.

Secondary Racks

(4) *Line Material Industries, McGraw Edison Co., Milwaukee 1, Wis.*

New secondary racks offered by this company are two-, three- or four-wire types. They are available either in extended or nonextended back styles. The company reports that the racks are lightweight, yet sturdy for supporting high dead-end and cantilever loads. Oval-shaped legs provide broad nonabrasive surfaces for safe wire stringing.

Low Sound Transformers

(5) *General Electric Co., Power Transformer Department, Schenectady 5, N. Y.*

Power transformers of 10,000 kva and up are now available with sound-deadening enclosures from this company. Steel hoods are fitted over the transformer tank and give reductions of from 15 to 21 decibels in audio sound levels. The resulting sound energy is only 3% or less of the original audio level.

1...SOURCE
for EVERY
ELECTRIC HEATING Need!
★ BUILT-IN ★ PORTABLES
★ Wall Attachables ★ BASEBOARDS
Fan-Forced! Radiant! Natural Convection!
Automatics & Manuals
500 to 5000 WATTS
New ELECTRIC Thrift Trim
BASEBOARD HEETAIRES
More Heat at Less Cost!
Cost less to buy... less to install! Over 300 watts per ft. Simple mounting. Splice boxes prewired to elements!
Automatic or Manual
in 2, 4, 6 and 8 ft. sizes.
500 to 3000 watts.
RADIANT
Wall-Insert
HEETAIRES
Low Cost
Automatic &
Manual Heaters
Series 240 *1000 to 1500 Watts*
New
Fan-Forced
BATHROOM
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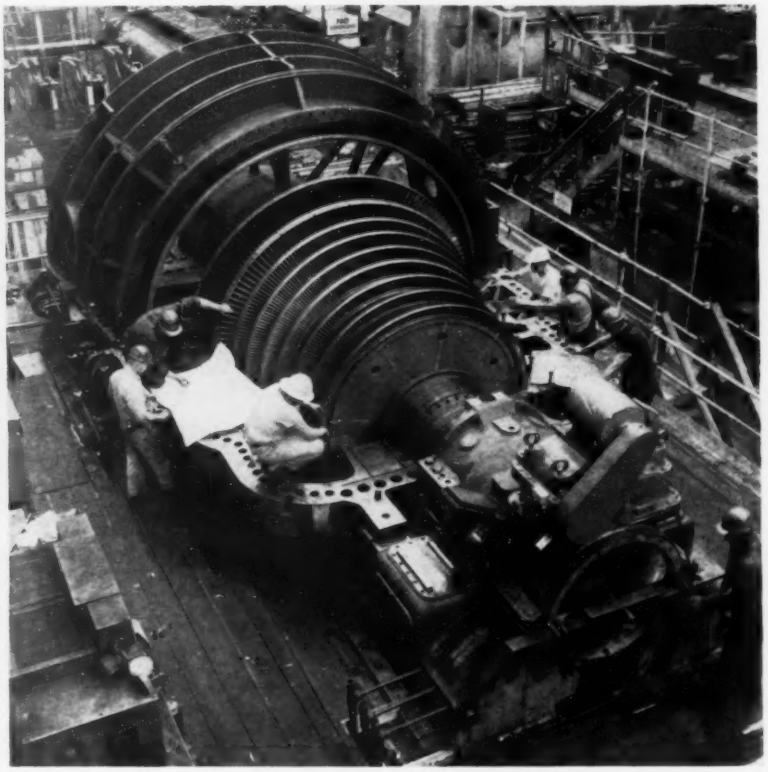


Turbine-Generator

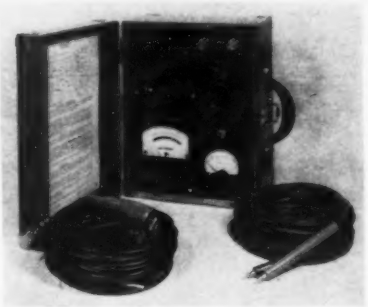
(6) *General Electric Co., Large Steam Turbine-Generator Department, Schenectady 5, N. Y.*

A steam turbine-generator unit that will exhaust its steam horizontally along the axis of the turbine shaft into the condenser is being manufactured by this company. The unusual arrangement has the condenser located directly below the exhaust end of the turbine. Two advantages of the design are: (1) improved efficiency of the turbine which leads to fuel savings, and (2) savings in the cost of the building structure.

Hydraulic Tail Gate

(7) *H. S. Watson Co.*, 1316 67*th St., Emeryville 8, Calif.*

A new hydraulic elevating tail gate announced by this manufacturer mounts underneath a pickup to the truck frame with only four bolts. With the reservoir, pump, valve and control switch all in one unit, it operates from either 12- or 6-v electric systems. A control package mounts in a convenient place on the side of a truck body. Lifting capacity is 800 lb, and this load is lifted in five seconds.



Microhm Meter

(8) *J. W. Dice Co., Englewood, N. J.*

A new microhm meter offered by this company is designed for making accurate resistance measurements in the microhm range. It is a service-type instrument said to have laboratory accuracy. The meter reads directly in microhms on the 0-75 range, and a selector switch cuts in multipliers for four additional higher ranges. The instrument checks oil and air circuit breaker contacts without disassembling the breakers, limiters, windings in transformers and rotating equipment. Current and potential leads are 20 ft long.

NOW! NEW! FABULOUS LUXWOOD® FIXTURES

Another MOE Light® Promotional First that's new and powerful

FREE OFFER! INTRODUCTORY PRICES! FULL PROFITS!

FREE! This $12.95 ceiling track when you buy this beautiful pull-down fixture
MOVES ACROSS→
↓PULLS DOWN
M-1479 reel pull-down ... Smartly designed for today's living. Match or contrast your furniture with elegant reel wood. Specially treated to accent the beautiful natural wood grain when fixture is lighted.
Special Introductory Offer complete with FREE 6-foot brass ceiling track ... $49.95

1 REAL WOOD FIXTURES

Here's beautiful "Wood-n-Brass" LUXWOOD—real cabinet wood fixtures dressed in gleaming polished brass . . . matching any decor by day, translucent by night—a *home* decorator's dream of beauty come true.

2 FREE OFFER

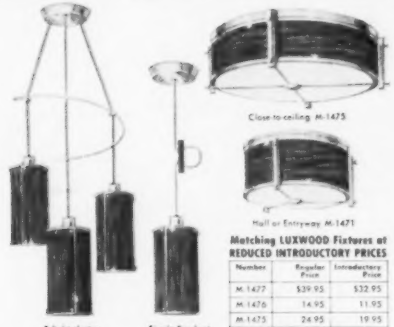
To spearhead your promotion and bring in customers . . . and at NO COST TO YOU!

3 SPECIAL INTRODUCTORY PRICES

Reduced 30 day introductory prices to consumers . . . and you get your FULL PROFIT because you get special prices too!

4 POWERFUL PROMOTION

This full page—Full Color ad appears in April Better Homes & Gardens and House & Garden. A powerful push behind an exciting NEW line. Get in on this huge promotion TODAY.



Matching LUXWOOD Fixtures at REDUCED INTRODUCTORY PRICES

Number	Regular Price	Introductory Price
M-1477	$39.95	$32.95
M-1476	14.95	11.95
M-1475	24.95	19.95
M-1471	11.95	9.95

... to introduce stunning new

LUXWOOD®

by MOE Light®

translucent fixtures of real wood

Here is LUXWOOD—most exciting lighting fixture idea years . . . real cabinet grain wood trimmed in gleaming brass . . . actually translucent when lighted. Five matching fixtures to dramatize every room in your home.

To introduce LUXWOOD fixtures your dealer will give you a 6-foot brass ceiling track FREE (regular retail price $12.95) when you buy the M-1479 pull-down fixture shown above at the regular price of $49.95.

With the polished brass ceiling track and LUXWOOD pull-down fixture you can move the light up or down and 6 feet in either direction. Beautiful over dining tables, breakfast nooks or conversation furniture groupings . . . it's a conversation piece in itself.

Matching Luxwood fixtures by Moe Light are perfect for redecorating home, office or store. Get these matching fixtures at special low introductory prices.

Special prices and free offer expire April 30, 1958

This is Big! Let's go!

Special Prices and FREE offer expire April 30, 1958. Write, wire, phone your Distributor TODAY or send in coupon below.

THOMAS INDUSTRIES INC.
LIGHTING FIXTURE DIVISION
Executive Offices—410 S. Third St., Louisville 2, Ky.
Leaders in Creative Lighting

THOMAS INDUSTRIES INC., products: Moe Light and Thor Light lighting fixtures . . . Wright power tools . . . Radiant opal glass . . . Ideal bathroom cabinets . . . Electric Sprayit paint spraying equipment

THOMAS INDUSTRIES INC., Lighting Fixture Division, Dept. BH-4
410 S. Third St., Louisville 2, Ky.
Enclosed 25c in coin. Send 56 page full-color Moe Light Inspiration-Lighting decorator guide and catalog.
Name _____
Address _____
City _____ Zone ____ State _____
Builders, Electrical Contractors attach this coupon to your letterhead for copy of Moe Light catalog.

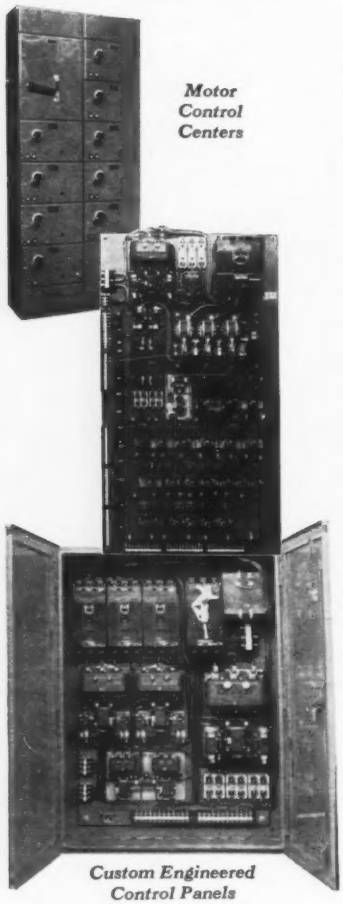
THOMAS INDUSTRIES INC.
LIGHTING FIXTURE DIVISION
Executive Offices: 410 S. Third St., Louisville 2, Ky.
Leaders in Creative Lighting

Thomas Industries Inc., MOE LIGHT Div., Dept. EW-2
410 S. Third St., Louisville 2, Ky.

The MOE LIGHT Promotion looks good to me. Send me details.

Name _____
Store Name _____
Address _____
City _____ Zone ____ State _____
My Distributor is: _____

CLARK Manufacturing Division in Los Angeles is at your service



Motor Control Centers

Custom Engineered Control Panels

You can now get faster deliveries of custom-engineered Clark control equipment from our West Coast plant, located in the Central Manufacturing District of Los Angeles. Sales, engineering and manufacturing services are coordinated in this modern 10,000 square foot building. These expanded facilities provide the most efficient handling of your control requirements. Increased space also means larger stocks of standard motor control apparatus for immediate delivery.

Factory-trained specialists are available to help you solve your control problems. King D. Christopher, formerly Los Angeles District Manager, is General Manager. Thomas J. Hegedus is Manufacturing Engineer, James A. Reimholz and Richard L. Somer are Application Engineers. Alvin D. Loughary coordinates orders and materials. Clyde Dickson handles your orders at the sales desk. For prompt efficient control service, call The Clark Controller Company in Los Angeles at LUdlow 3-6366.

Other Clark sales offices in—

San Francisco	Phone Diamond 2-6051
Denver	Phone DExter 3-5434
Portland	Phone CApitol 8-2671
Seattle	Phone ELliot 5960
El Paso	Phone 3-9751
Salt Lake City	Phone ELgin 5-5378
Boise	Phone 2-6947

The **CLARK CONTROLLER** *Company*

Los Angeles Division 4755 East 49th St., Los Angeles 58, Cal.

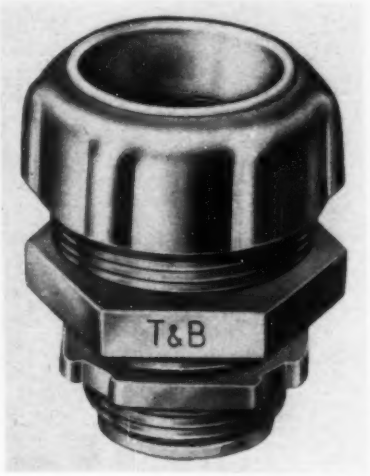
Phone LUdlow 3-6366 CE

HOME OFFICES AND MAIN PLANT • CLEVELAND, OHIO

Conductor Clamp

(9) *Barron Bethea Co., Box 2202, Birmingham 1, Ala.*

A new design is said to give this clamp holding strength greater than the conductor it fits. The keeper is not reversible, and is peened securely to the U-bolt to reduce the number of removable parts. Pulling eye will accommodate the largest hooks, the manufacturer reports. Over-all dimensions are about 4½ x 4½ in. Clamping range is from .160 to .522 in., and clamp has a rated strength of 12,000 lb. Designed for use on ACSR conductors from 4 to 1/0, inclusive, and copper conductors from 6 to 4/0, as well as Copperweld and Amerduct.



Conduit Connectors

(10) *Thomas & Betts Co., 36 Butler St., Elizabeth, N. J.*

To protect conductors from abrasion at termination points in liquid-tight flexible conduit and to facilitate wire pulling, this company has de-

signed a new line of liquid-tight conduit connectors with insulated throats. The insulated throat covers the edges of the connector to provide a smooth path for the conductor while it is being pulled through the connector. The throat also serves as a permanent protection for the wire insulation at that point.

Ohmmeter

(11) *James G. Biddle Co.*, 1316 *Arch St., Philadelphia 7, Pa.*

This new low resistance ohmmeter is a direct reading instrument that is suitable for either field or bench use. Is said to have wide application including resistance measurements of electrical conductors, joints, contacts and windings of the low resistance type in oil circuit breaker assemblies, rotating electrical equipment, transformers and coils. Two models are available, one with battery power supply and the other with a rectifier so it can be used in any ordinary lighting circuit.

Secondary Capacitor

(12) *Westinghouse Electric Corp., Box* 2099, *Pittsburgh* 30, *Pa.*

A new 10-kvar, single-phase, 240-v secondary capacitor is now available from this company. It is an addition to the existing line of smaller units. It is contained in a rectangular steel case with a zinc spray finish. A ground stud is welded to the top of the case. A new set of mounting brackets provides for direct pole mounting. The bracket uses no hardware. The weight of the capacitor combined with bracket design keeps the unit securely in place, but permits easy removal.

action—
WHEN YOU NEED IT MOST!

HILL 2000 KVA power transformer (13.2 to 2.4 kilovolt delta) loaded for shipment to White Bluff Pumping Plant No. 1, Columbia Basin Project, Washington. Ordered through electrical wholesaler for the Bureau of Reclamation.

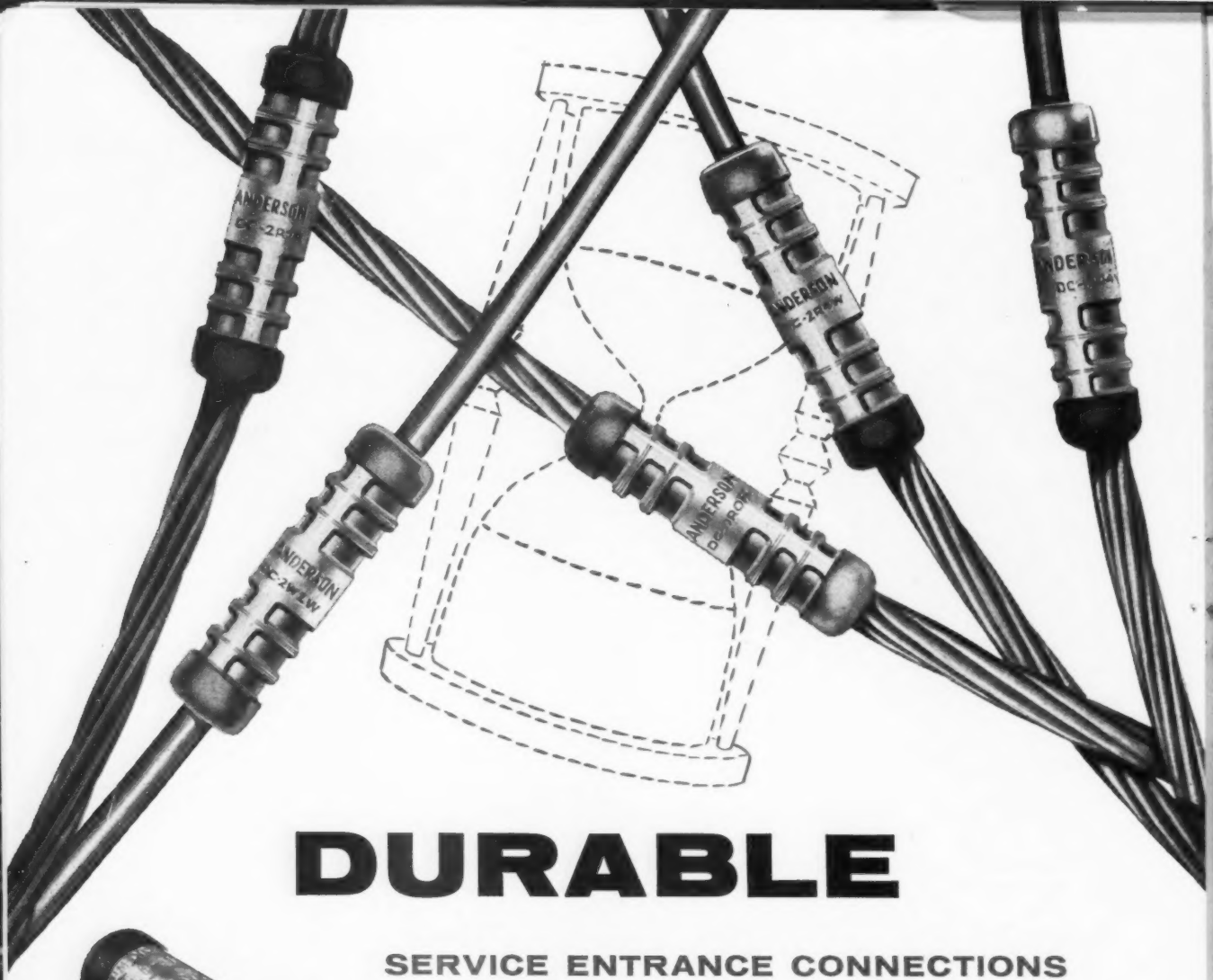
When you need an immediate answer to a transformer problem—check first with HILL. You'll find HILL's production and delivery schedules a definite help. Power and distribution transformers up through 5000 KVA for every application—designed to your exact specifications, manufactured to NEMA and ASA standards.

OIL FILLED • ASKAREL
DRY TYPES

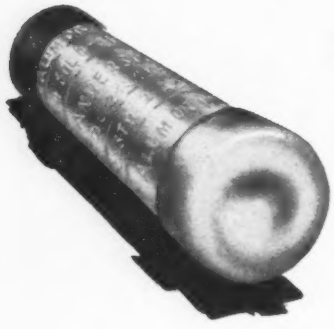
HILL

HILL TRANSFORMER CO., INC.
1030 WASHINGTON STREET
SAN CARLOS • CALIFORNIA

Available through leading electrical wholesalers



DURABLE



SERVICE ENTRANCE CONNECTIONS with ANDERSON DURA-CRIMP COMPRESSION SLEEVES

High conductivity! Quick, simple and easy installation!
Compact and neat! Wide range of conductor combinations!

Anderson Dura-Crimp Compression Sleeves are plainly marked to show (1) die size, (2) die press area, (3) catalog number and (4) complete cable size application. 5/8" O.D. line consists of 17 sizes to accommodate all combinations of Aluminum, ACSR and Copper conductors from #8 AWG to 1/0 AWG. 1/2" O.D. line, 14 sizes for all combinations of Aluminum, ACSR and Copper conductors from #8 AWG to #2 AWG.

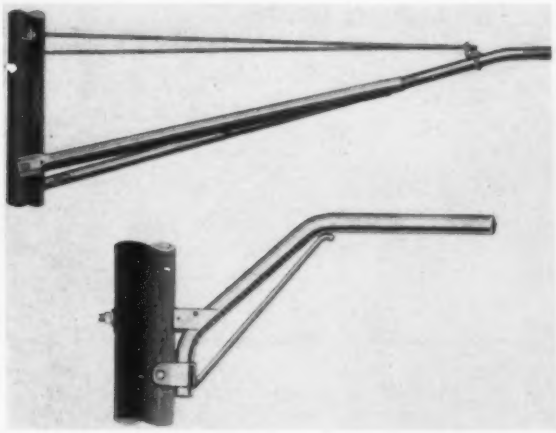
Caps, color coded to indicate cable size, are easily removed or punctured by cable.

Anderson's exclusive inhibitor increases conductivity and pull-out strength. The inhibitor's correct distribution in both grooves is assured by a solid, built in center, which also insures correct cable length in each groove and prevents direct cable contact.

Contact your ANDERSON Representative for complete details . . . or write to our home office.

Aluminum & Bronze POWER CONNECTORS • CLAMPS • FITTINGS • ACCESSORIES
for SUBSTATION • TRANSMISSION • DISTRIBUTION

ANDERSON ELECTRIC
CORPORATION



Street Light Brackets

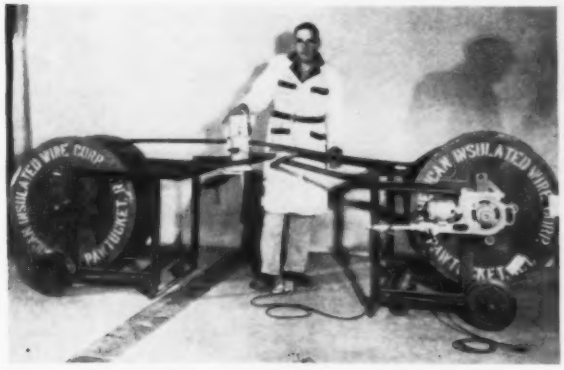
(13) *Hubbard & Co., 6301 Butler St., Pittsburgh 1, Pa.*

A new line of galvanized steel street lighting brackets for fluorescent luminaires has been developed by this manufacturer. It is designed to provide improved horizontal deflection characteristics. Carrying luminaires having up to 8 sq ft of projected area, the brackets will withstand wind velocity up to 100 mph, the company reports.

Aluminum Bus Bars

(14) *Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa.*

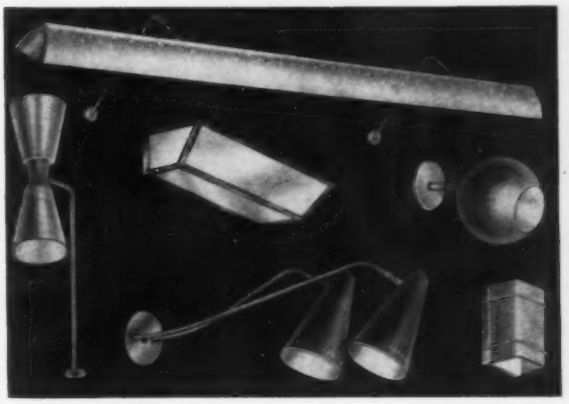
This company announces the commercial availability of aluminum alloy bus bars with a guaranteed minimum electrical conductivity of 60% IACS, at no increase in price. Figures released by the manufacturer place the tensile strength of the bus at 15,000 psi with a yield strength of 8,000 psi, and with excellent bending properties.



Cable Handler

(15) *Weber Electric Mfg. Co., 15224 Kercheval Ave., Detroit 30, Mich.*

This new power driven cable handler has a power unit that is usable for pulling cable through conduits and also for use on a coiler stand. Two models available handle, respectively, reels up to 32 in. wide weighing 2,000 lb and reels up to 42 in. wide weighing 3,000 lb.



Store Lighting

(16) *Peerless Electric Co., 576 Folsom St., San Francisco, Calif.*

This company announces a complete line of store lighting fixtures featuring both fluorescent and incandescent designs. Factory production is arranged to provide variations in size and mounting as needed for any installation. All incandescent cone, cylinder and sphere directors are furnished either as individual units or mounted as spans with any specified number of units. Fluorescent cornice, strip and showcase models are available in required lengths for all sizes and types of lamps. Can be joined for continuous run.

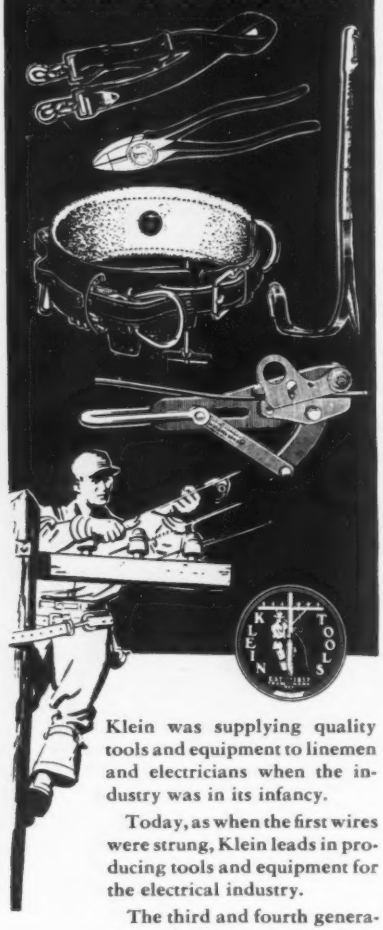
Pole-Setting Tool

(17) *San Joaquin Hydraulic Inc., 546 M St., Fresno, Calif.*

Hydro-Pike is a new hydraulic tool that makes pole-setting and maintenance a two-man job. Designed and developed by a line foreman of a Western utility company, it operates as simply as an automobile jack, yet a pair of the tools easily aligns the heaviest poles. It has a hydraulic lift of 18 in. and a 3,000 lb capacity, supplied by a standard hydraulic unit.

KLEIN

FOR GREATER SAFETY, BETTER PERFORMANCE



Klein was supplying quality tools and equipment to linemen and electricians when the industry was in its infancy.

Today, as when the first wires were strung, Klein leads in producing tools and equipment for the electrical industry.

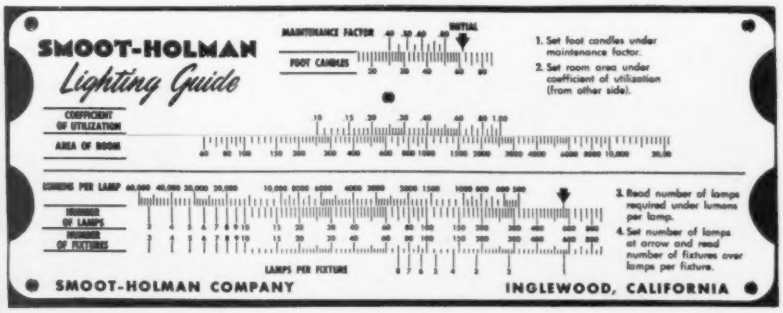
The third and fourth generations of Kleins are still adhering to the quality standards set a century ago. The new Klein plant, equipped with the latest in manufacturing facilities, assures better, safer equipment, wherever power lines or communication lines are strung.

100 years of service to linemen, electricians and industry is back of this new Pocket Tool Guide No. 100. A copy will be sent you on request without obligation.

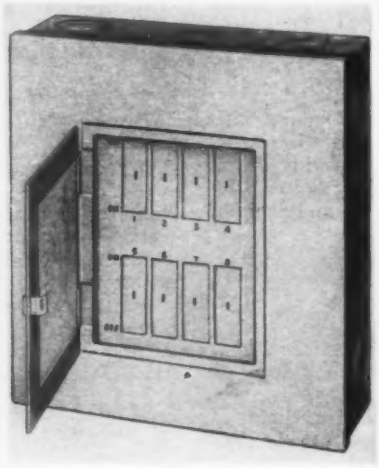
Mathias Established 1857 KLEIN & Sons Chicago, Ill., U.S.A.

7200 McCORMICK ROAD • CHICAGO 45, ILLINOIS

Free Lighting Guide


SMOOT-HOLMAN
Lighting Guide
MAINTENANCE FACTOR
FOOT CANDLES
INITIAL
1. Set foot candles under maintenance factor.
2. Set room area under coefficient of utilization (from other side).
COEFFICIENT OF UTILIZATION
AREA OF ROOM
LUMENS PER LAMP
NUMBER OF LAMPS
NUMBER OF FIXTURES
LAMPS PER FIXTURE
3. Read number of lamps required under lumens per lamp.
4. Set number of lamps at arrow and read number of fixtures over lamps per fixture.
SMOOT-HOLMAN COMPANY
INGLEWOOD, CALIFORNIA

(18) Smoot-Holman Co., Inglewood, Calif., is offering this handy, slide rule for quickly figuring co-efficient of utilization, the number of fixtures and lamps needed for a certain size of room, and maintenance factor *(Fill in coupon on page 29)*



Load Center

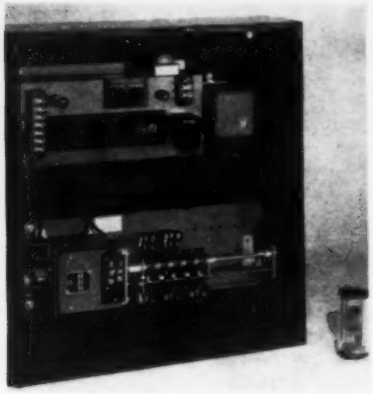
(19) *Wadsworth Electric Mfg. Co., Covington, Ky.*

This company's new circuit breaker load center is designed to take the E-Z-Red circuit breakers 15 to 50 amp, single and double poles or 15- to 20-amp switching neutrals for gas stations. The enclosure is available in either indoor or outdoor type for 6 or 8 circuits. The enclosure is for three-wire service, solid neutral 100/240 v a-c. They are equipped with line side lugs, including neutral, which are silvered.

One-Can Ballasts

(20) *Jefferson Electric Co., Bellwood, Ill.*

This manufacturer has developed a line of one can fluorescent ballasts for 4-, 6- and 8-ft power groove and VHO lamps for cold weather operation. The new ballast design is set to save up to 8 lb per unit in weight and nearly 13 in. in length per unit over comparable two-can ballasts.



Light Control System

(21) *Minneapolis-Honeywell Regulator Co., Wayne & Windeim Aves., Philadelphia, Pa.*

A new control system that automatically regulates indoor lighting levels in commercial buildings according to the amount of prevailing natural light is announced by this company. The system automatically measures with a phototube incoming daylight and turns artificial lighting on or off in proper amounts to maintain the desired illumination. It can be used to control either fluorescent or incandescent lights, although dimming is less expensive with incandescent lamps. Automatic control of artificial light takes place when the phototube signal operates a switching motor.

MOLDED CASE CIRCUIT BREAKERS

I-T-E magnetic trip Type ETI circuit breakers provide readily accessible trip adjustment.

FOR MOTOR APPLICATIONS... ETI BREAKERS INSURE BETTER PROTECTION

Type ETI magnetic trip circuit breakers employ specially designed overload devices to provide pinpoint, instantaneous short-circuit protection. When used in conjunction with motor protective relays, Type ETI molded case circuit breakers represent the ultimate in motor protection.

A new, informative booklet—yours for the asking—explains in detail why Type ETI molded case circuit breakers insure better protection.

As manufacturers of all types of circuit breakers—and the manufacturers of industry's most complete line of molded case breakers—I-T-E offers this booklet as a service to the electrical industry. Small Air Circuit Breaker Division, 19th & Hamilton Sts., Phila. 30, Pa.

WRITE TODAY FOR THIS NEW BOOKLET

Please send me your new booklet **"TYPE ETI MOLDED CASE CIRCUIT BREAKERS FOR MOTOR CIRCUITS"**

Name _____

Company _____

Address _____

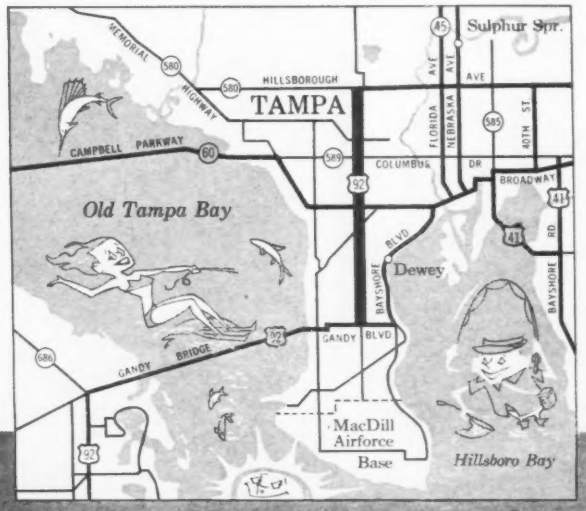
City _____ Zone ____ State ____

I-T-E CIRCUIT BREAKER COMPANY
PHILADELPHIA, PENNSYLVANIA

There are brighter nights ahead...and HAPCO points the way

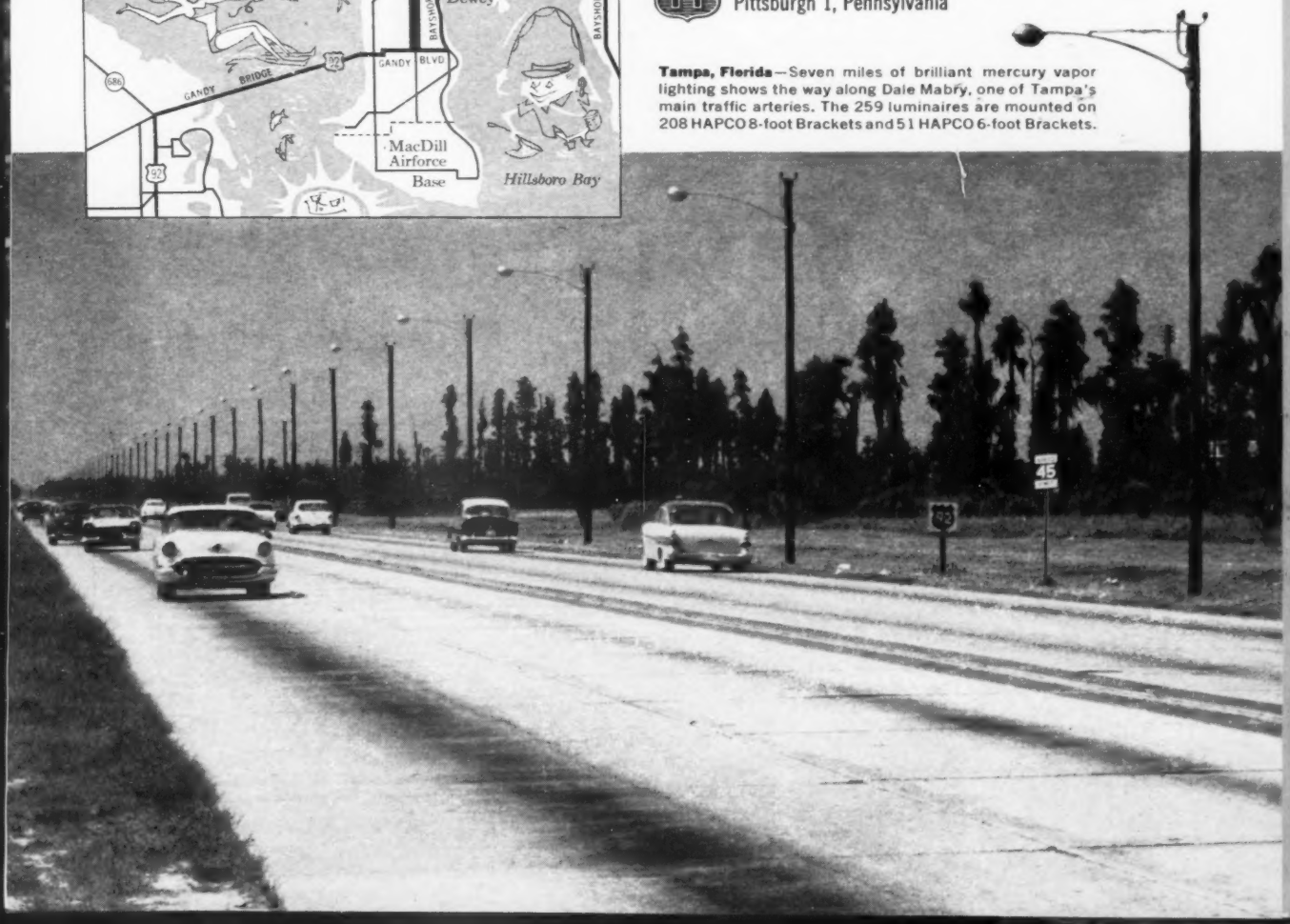
Day by day, the rapid growth in our network of freeways, express roads, parkways and toll roads becomes more apparent. Each business trip, every vacation tour exposes wider, straighter, smoother and safer highways. At night, thanks to modern lighting methods, these "super" expressways maintain high levels of visual safety. Slim, trim Brackets and Poles by Hubbard Aluminum Products Company support the luminaires in an ever increasing number of these modern installations.

For example, a recent Florida installation by Tampa Electric Company lights up a busy seven mile stretch of four-lane Dale Mabry Highway. From the northern City Limits to Gandy Boulevard, traffic moves easily and safely, day and night, over this heavily travelled section of U. S. Route 92. The job required 259 mercury vapor luminaires, all supported by HAPCO Brackets. In the complete HAPCO line of Standards and Brackets are designs for all types of modern, low-maintenance outdoor lighting installations. For more information, write to Hubbard Aluminum Products Company, 6301 Butler Street, Pittsburgh 1, Pa.



HUBBARD ALUMINUM PRODUCTS COMPANY

Division of Hubbard & Company
Pittsburgh 1, Pennsylvania



Tampa, Florida—Seven miles of brilliant mercury vapor lighting shows the way along Dale Mabry, one of Tampa's main traffic arteries. The 259 luminaires are mounted on 208 HAPCO 8-foot Brackets and 51 HAPCO 6-foot Brackets.

BULLETINS ETC.

(22) FLOOR BOXES—Bulletin No. 4-A of Russell & Stoll Co. Inc., 125 Barclay St., New York 7, N. Y., describes and illustrates the company's full line of R & S floor boxes, including new items, and gives technical cross sections in colors and many catalog data pages.

(23) BOILER CONTROL—Copes-Vulcan Division, Blaw-Knox Co., Erie, Pa., has published bulletin 1038, which describes the complete control systems available for large utility power stations. A two-page schematic diagram shows simplified hookup of all components from the primary controlling elements to the pneumatic regulating actuators.

(24) FLUORESCENT BALLASTS—A comprehensive cross index replacement guide for fluorescent lamp ballasts has been published by Universal Mfg. Corp., 29-51 E. Sixth St., Paterson, N. J. The replacement guide is printed on heavy board stock for wall mounting. Listed are more than 120 type numbers, with electrical ratings of ballasts made by five major manufacturers.

(25) MOBILE ELECTRIFICATION—Insul-8-Bar enclosed conductor systems for cranes, monorails and moving machinery are fully described in a new six-page brochure. Copies of pamphlet 8-57 are available from Insul-8-Corp., 1369 Industrial Road, San Carlos, Calif.

(26) HIGH-BAY FIXTURE—A four-page catalog in two colors shows All-Brite's radical new concept in low-cost high bay lighting. The fixture is designed to use the new General Electric Power Groove lamps. Catalog describes the high output of 2½ times more than conventional fluorescent lamps. Write to Fluorescent Fixtures of California, 352 Shaw Road, South San Francisco, Calif.

(27) POTHEADS—Delta-Star Electric Division, H. K. Porter Co. Inc., has just released a 12-page, 2-color catalog describing and illustrating its new line of Seal-Kap Terminators (potheads). Publication number is 5703. Covered are new single- and three-conductor cable-sealing devices for indoor and outdoor service; corrugated and petticoat-type bushings. The address is 2437 Fulton St., Chicago 12, Ill.

(28) TRANSFORMERS—Some of the research facilities for Allis-Chalmers wide line of transformers along with their design and construction features are described in a new bulletin released by the company. Write to the company at Milwaukee 1, Wis., and ask for bulletin 61B6186C.

(29) TIME SWITCH CHART—Tork Time Controls Inc., Mount Vernon, N. Y., has published selector charts classifying the features of its various time switch products. The charts are said to make possible instant selection of the time switch needed for a particular installation.

(30) ALUMINUM WELDING FITTINGS—New designs in aluminum welding fittings, engineered to provide maximum strength and conductivity, are illustrated in a new catalog released by Royal Electric Mfg. Co. The new catalog lists all the new aluminum welding fittings and useful design information. Write to the company at 1122 E. 87th St., Chicago 19, Ill.

(31) POWER REGULATORS—Complete redesign of its single-phase power regulators has been announced by Allis-Chalmers. A complete description of the redesigned single-phase power regulator is contained in a new bulletin 21B-6065D available on request from Allis-Chalmers, Milwaukee 1, Wis.

KILL TWO BIRDS WITH ONE STONE—Fill out this coupon and get back valuable information from as many sources as you indicate.

ELECTRICAL WEST
68 Post St., San Francisco 4, Calif.

Not good after April 1

Please send me, without obligation, the new product information or catalogs:

If described in Product News, circle item number

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16 17 18 19 20 21 22 23 24 25 25 27 28 29 30 31

If described in advertising, fill in page number

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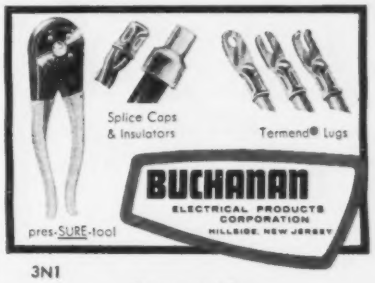
*Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

BUCHANAN Nylon Insulators, with internal metallic locking rings, snap securely and permanently over Buchanan Splice Caps. Easily and quickly installed even in extremely cold weather — even on flexible wire.

- Just two sizes of Splice Caps and Insulators splice all wire combinations from 2 #18's through 3 #8's or 2 #6s.
- The Buchanan C24 pres-SURE-tool installs both sizes of Splice Caps — and also installs Termend lugs on #16 through #8 wire.
- Insulators are approved for 600 volts on building wire, 1000 volts in fixtures in applications to 105°C.

Ask your wholesaler or write for Bulletin W-2



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Represented by
KENNETH M. ANDERSON CO.
Los Angeles, San Diego and Phoenix
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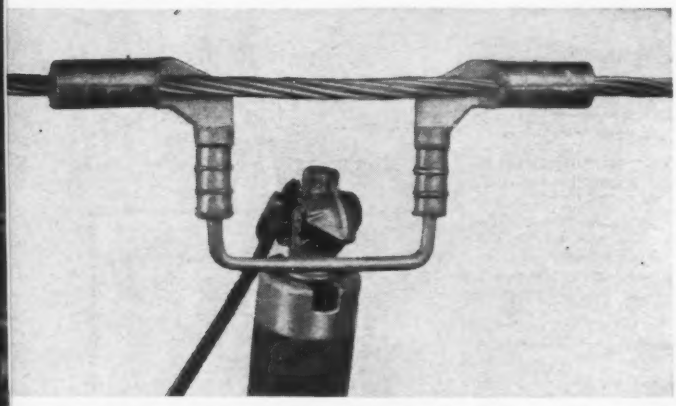
FRED A. PEASE CO. - Denver
KEELER WHITE, INC. - Portland and Seattle

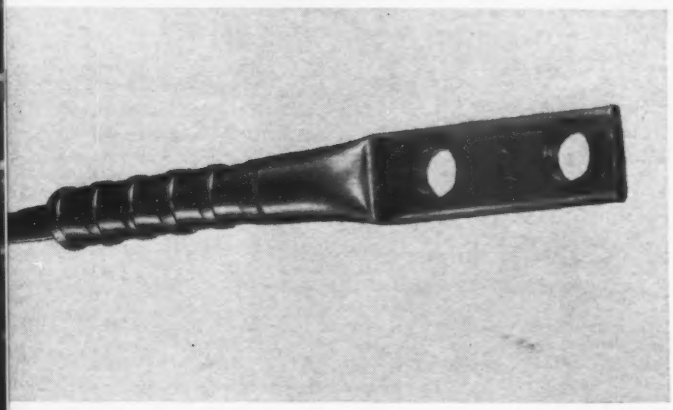
Kearney's compression program

Added versatility and increased application with existing tools—that's what an investment in Kearney Compression can mean for your system. Besides the basic connections—Squeezons, Serv-En Service Entrance Sleeves, Tension Sleeves and others—you receive the advantages of ever widening tool flexibility as Kearney Engineers continue to develop and introduce new Compression Fittings to the field.



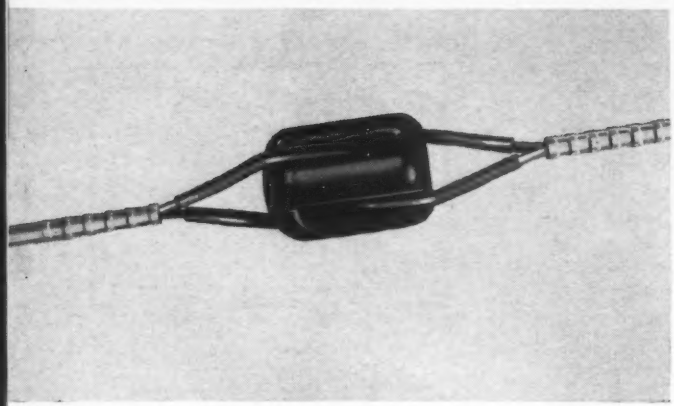
KEARNEY L Squeezon Stirrup

Line side connections are outside the basket—sufficient clearance for either the hydraulic or mechanical tool. The three inch dimension between the line and stirrup makes the unit neat and compact—hot line clamps are readily installed. Unit may be completely covered with line guards.



KEARNEY Compression Terminal

Kearney Compression Terminals provide an efficient method of connecting aluminum conductors to terminal pads. Flaring of strands possible with conventional terminal pads is eliminated. The strands are retained in an aluminum sleeve. Terminals have NEMA 1¾" bolt centers. May also be used as disconnectable jumpers around double dead-ends. The sleeves are filled with Kearnalex Contact Aid and capped and will take conductor sizes from 1/0 to 397.5 MCM 18/1 ACSR.



KEARNEY Insulated Splice

The Insulated Splice was designed primarily for splitting secondaries into shorter sections where additional transformers have been installed and for series street lighting applications. No changes in existing construction are required. Designed for copper, aluminum and ACSR connections, this splice features one piece construction, tension-type sleeves, insulated stainless steel bails and a high strength strain insulator. Splice can be installed with Kearney Hydraulic or Mechanical Tools. ACSR and aluminum sleeves are packed with Kearnalex Contact Aid and plastic capped.

JAMES R. KEARNEY CORPORATION • General Offices: 4224-42 Clayton Ave., St. Louis 10, Mo.

KEELER WHITE, INC. - Portland and Seattle

pays extra dividends

KEARNEY INSIDE TAPERED COPPER SLEEVE

A completely new, cost-cutting design—another Kearney "dividend"—permanent, positive, full tension splicing of energized conductors with standard Kearney tools and dies.

ADVANTAGES—

1. **Metallizing process**—copper sleeve is sprayed internally with conductive metal to assure maximum holding power and high conductivity.
2. **Full Inside Taper**—design assures ease of insertion of hot conductors—also relieves stress, due to vibration, at the extremities of the sleeve.
3. **Shorter Length** means less installation time, fewer crimps and no sacrifice of holding power—sleeve is more easily stored.
4. **Clearly marked** with conductor and die sizes.

KEARNEY WH-1 TOOL

A rugged, reliable hydraulic tool which expedites the installation of Kearney compression fittings and sleeves. Hi-speed, two-valve pump permits fewer strokes for full compression—exerts 21,000 pounds thrust. The narrow "C" head permits full visibility of the working area. Balanced weight enables the lineman to position the tool quickly and accurately for each indent. Interchangeable, insulated wood handles with extra length are available for working higher voltages.

FOR BETTER CONSTRUCTION—SAFER MAINTENANCE

Specify Kearney Products

IN THE WEST: for prompt service, contact Kearney's West Coast Distributor, **Maydwell and Hartzell, Inc.,**
Los Angeles • Seattle • Portland • San Francisco • Spokane • Phoenix.

PLANTS AT: ST. LOUIS • FAYETTEVILLE, ARKANSAS • SHENANDOAH & CLARINDA, IOWA • GUELPH, ONTARIO, CANADA

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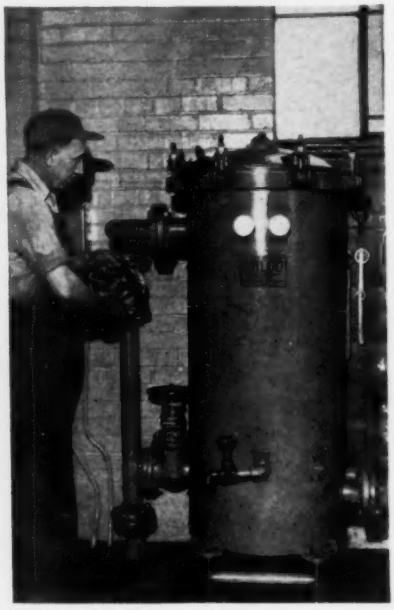
STANDARD ENGINEER'S FIELD REPORT

PRODUCT **RPM DELO OIL**

FIRM **ELKO LAMOILLE POWER CO.**
Elko, Nevada

RPM DELO Oil holds wear to .003″ in 9,791 hrs.

In initial operation, this 2,045-hp Enterprise diesel lubricated with RPM DELO Oil ran continuously for 9,791 hours. Average wear on engine's eight 17" diameter cylinders was just .003"! Plant Manager Hugh Liparelli says, "Frankly, the clean condition of the pistons and liners surprised me. I expected them to be coated with varnish, but instead we found them bright and shiny. The engine looked as if it had only run about 2,000 hours. There were no stuck rings, no engine deposits of any kind." The engine drives a 1450 KW generator at Elko Lamoille Power, went into service in 1954.



Hilco oil filter for Enterprise diesel operates whenever engine is running, helps keep oil clean, permits longer continuous operation. RPM DELO Oil, the only lubricant used in this engine, is also used in cylinder lubricators of station's five other diesels. Elko Lamoille Power Co. has used RPM DELO OIL since its introduction.

Why RPM DELO Oils reduce wear—prolong engine life

- Oil stays on engine parts—hot or cold, running or idle
- Anti-oxidant resists lacquer formation
- Detergent keeps parts clean
- Special compounds prevent corrosion of bearing metals
- Inhibitor resists crankcase foaming.

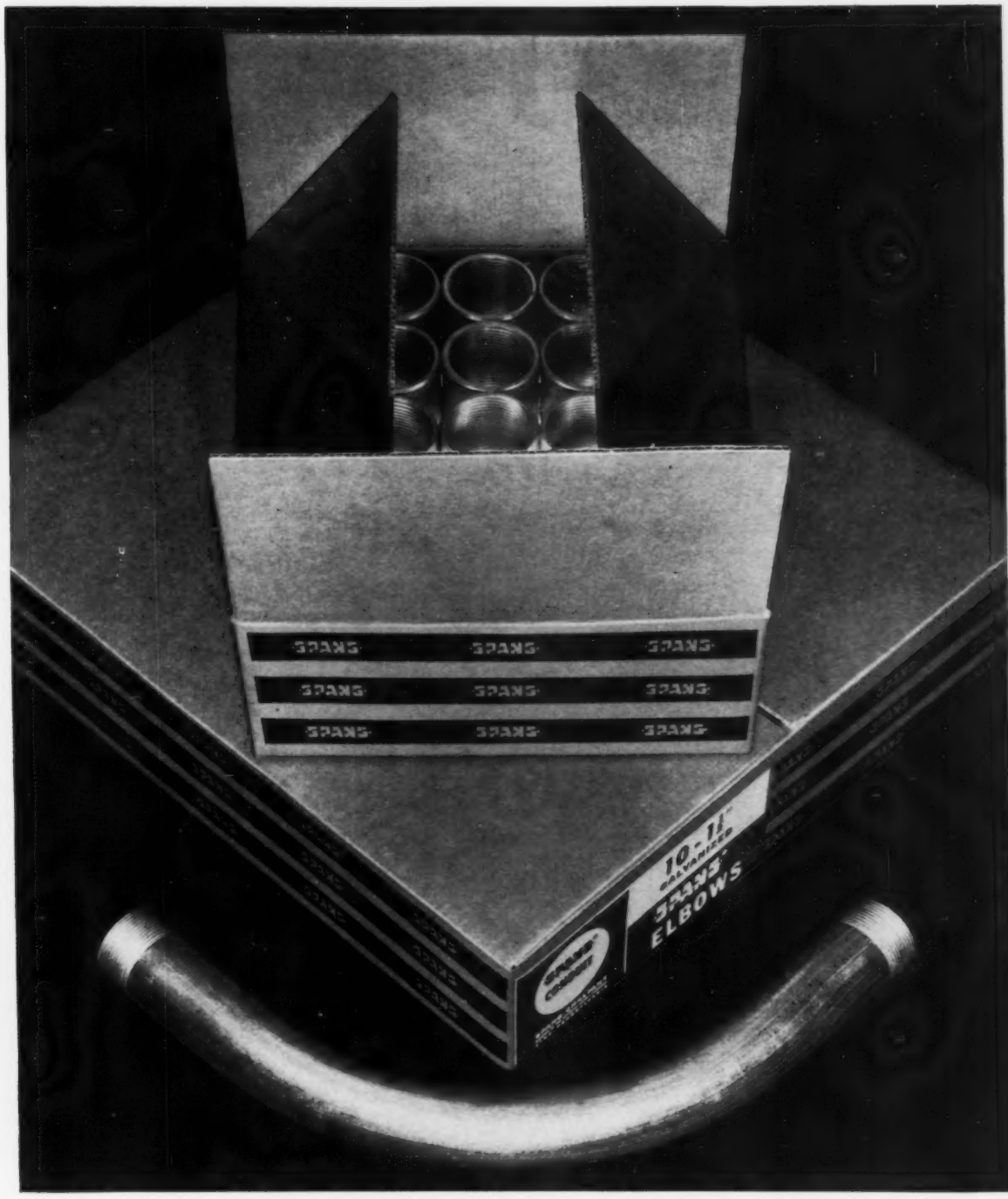
For More Information on this or any other petroleum product contact your Standard Engineer or representative, or write 225 Bush Street, San Francisco 20, California.

LUBRICATING OILS RPM DELO

TRADEMARKS "RPM DELO" AND CHEVRON DESIGN REG. U.S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA

PLANTS AT: ST. LOUIS • FAYETTEVILLE, ARKANSAS • SHENANDOAH & CLARINDA, IOWA • GUELPH, ONTARIO, CANADA



Your shipments of SPANG Conduit Couplings and Elbows now come in these newly-designed blue-striped cartons. Why the change? The high visibility of the new cartons and labels make it easier for you to spot them in a hurry, easier to pick out of stock what you need when you need it, easier to inventory. Inside—the same *top-quality* SPANG Couplings and Elbows you've been using right along. Your nearby SPANG Distributor carries the complete line of SPANG Couplings and Elbows in the new cartons . . . and SPANG Conduit and SPANGLEAM EMT, too. He'll give you *top-quality* service. Give him a call.

SPANG® CONDUIT

SPANG-CHALFANT
Division of The National Supply Company
GENERAL SALES OFFICE:
TWO GATEWAY CENTER, PITTSBURGH, PA.
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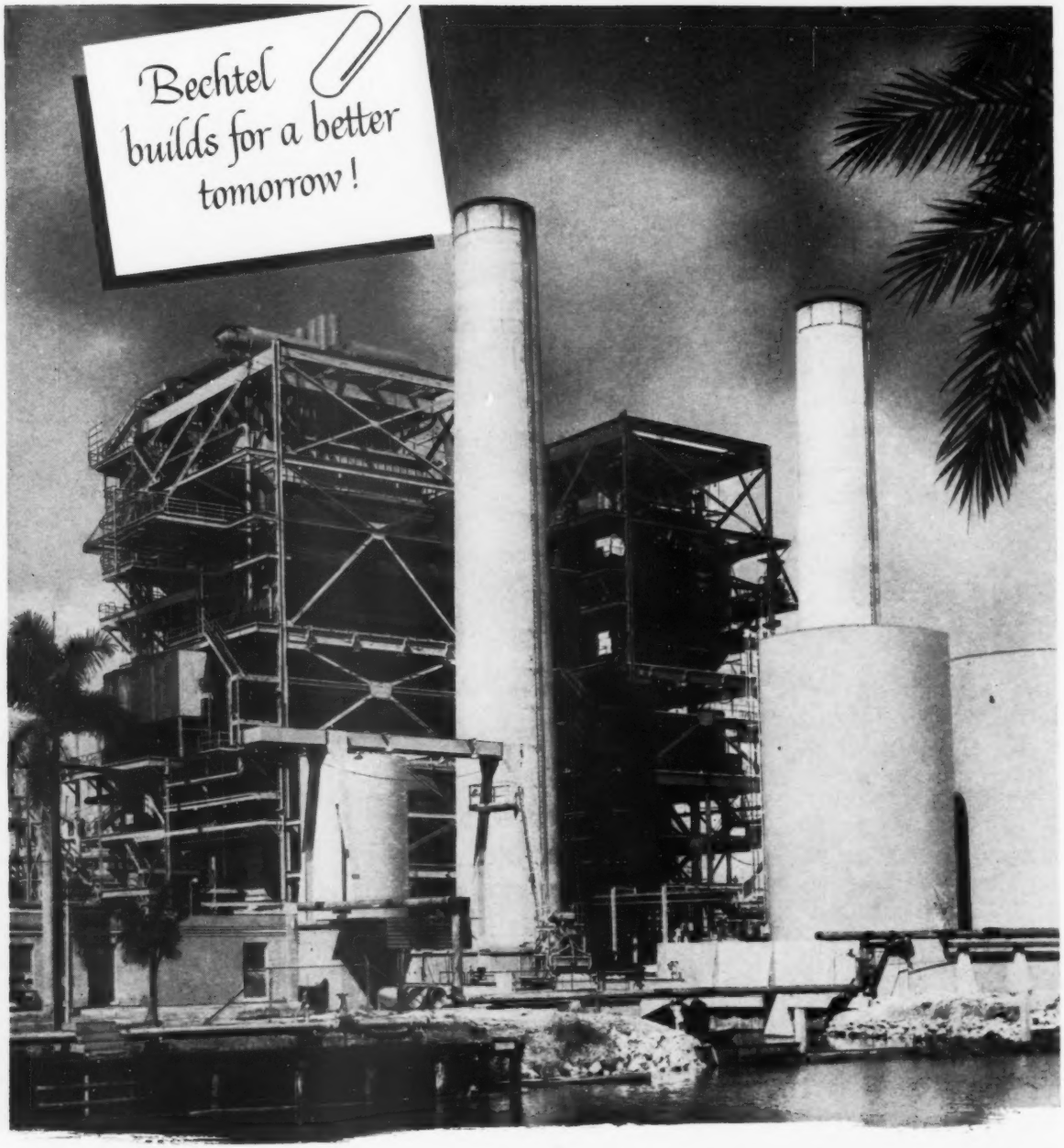


FLORIDA'S GROWING POWER RESERVE

To meet Florida's constantly-mounting demand, Florida Power and Light Company is continuing a substantial program of expansion.

One new unit capable of producing 160,000 kilowatts was added to its Lauderdale Plant last fall. Another of equal size is scheduled for initial operation this spring.

A new steam-electric plant will be built at Port Everglades, with completion dates in 1960-1961. Rated capability will be 480,000 kilowatts with planned eventual maximum capability of two millon kilowatts.

Bechtel is responsible for engineering and construction both at Fort Lauderdale and Port Everglades.

BECHTEL

Engineers and Builders for Industry

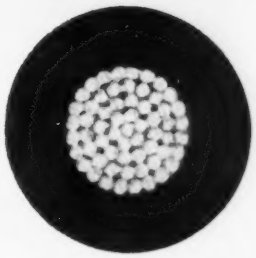
BECHTEL CORPORATION — SAN FRANCISCO · Los Angeles · New York · Houston — CANADIAN BECHTEL LIMITED — Toronto · Vancouver

2
Conductor is put under controlled tension, which is maintained during entire insulating process.
3
Butyl insulation is extruded downward around conductor.
Here's how Roebling VCV works!
1
Strand wrapped in semi-conducting tape goes up through 4-story, high-temperature tube. This drives out gases and moisture from core, and preheats the conductor for more uniform curing.
4
Vulcanization takes place continuously and uniformly in vertical tube. Constant high steam pressure assures dense, sound insulation.
5
Insulation never touches anything until high-pressure water cooling is complete. The result is unvarying roundness, smoothness and concentricity of butyl insulation.

The Conductor is Always Dead Center

ROEBLING

VCV



ROEBLING'S 15 KV CABLE HAS UNIFORMLY HIGH CORONA LEVEL AND DIELECTRIC STRENGTH. VERTICAL CONTINUOUS VULCANIZATION ASSURES UNUSUALLY LONG TROUBLE-FREE CABLE SERVICE.

If you sliced a length of Roebling's VCV 15 kv Cable into cross sections, you'd find that *every inch* is uniform, every inch is round, and in every inch the conductor is exactly centered!

VCV is responsible for the exceptional quality of this new high-voltage cable. No longer will you buy cables in which the conductor has "snaked," or that has flattened, scraped, blistered or abraided insulation. Because insulation is the same thickness and density for the length of the cable, dielectric strength and corona level are uniformly high.

ROEBLING VCV 15 kv CABLES are available in a complete range of conductor sizes and insulation thicknesses

Write today for more facts about the longer, better service you'll get with Roebling VCV High-Voltage Cable. Electrical Wire Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

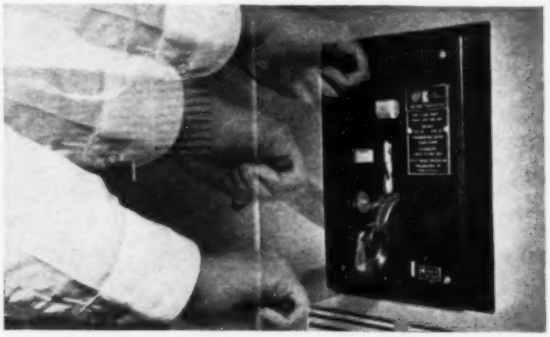
ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

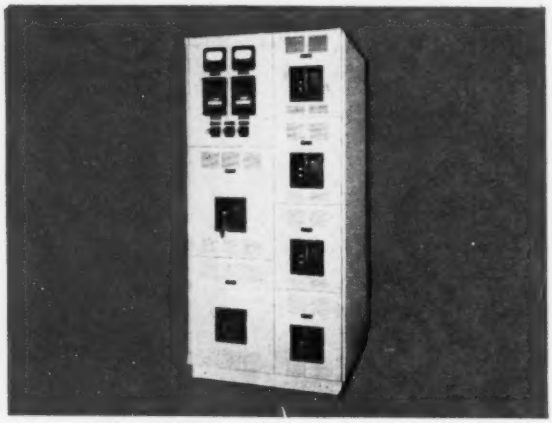
I-T-E makes sweeping design advances in new low voltage power circuit breakers, switchgear

I-T-E's new K-Line offers better performance, greatly simplified operation and servicing, and standardization in construction and assembly

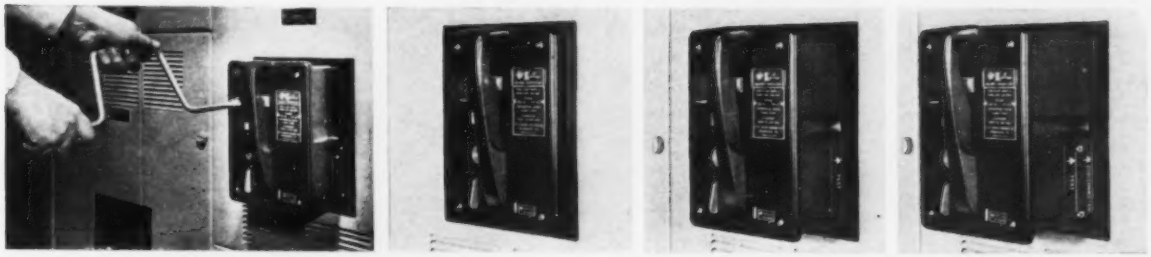
Now we offer a complete new design of equipment for the switching, control and protection of motor, generator, transformer and feeder circuits, as well as other large electrically powered facilities—the most sweeping design advance in 13 years. Among the major innovations in the new design are the following.



First quick-make manually charged stored energy closing mechanism. First 90% of pulldown handle travel charges spring mechanism, last 10% releases stored energy, automatically closes contacts. No teasing of contacts is possible.

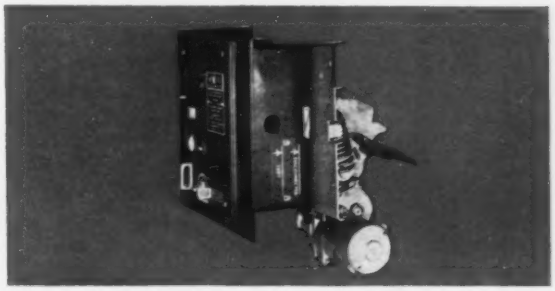


4-high stacking of 600 amp frame size circuit breakers in 90-in.-high enclosures. The new circuit breakers are as much as one-third smaller and 55% lighter than comparable units. The new switchgear is the smallest ever designed.

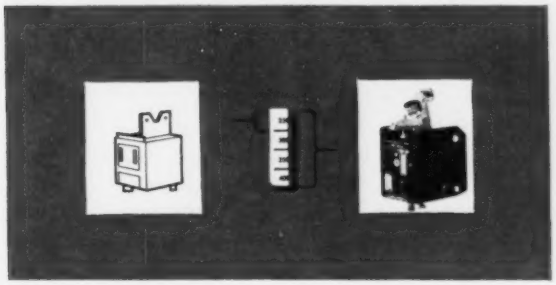


First closed-door drawout of circuit breakers. This permits racking of circuit breaker into connected, test and disconnected positions without opening the door of the circuit breaker compartment. Drawout arrangement keeps circuit breakers clean, aisles uncluttered, promotes personnel safety. Breaker must be opened before shutter can be lifted to insert drawout racking crank. Breaker cannot be closed while shutter is lifted.

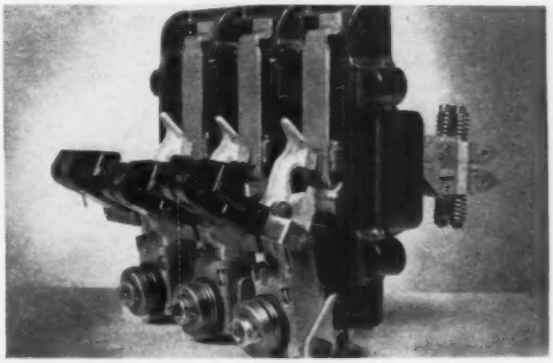
Greatly increased accessibility to component parts for operation and servicing. For example, trips on electrically and manually operated breakers are out in the open and can be easily adjusted. Trips also can be changed quickly. One-piece molding holds trip units, which are changed from the rear and in a fraction of the time formerly required.



Stored energy electrical closure that materially cuts control circuit requirements. The motor-driven stored energy system requires only 10 amp from a simple power source, compared to as much as 160 by comparable solenoids. Quick-make manual closure operates on same principle. First 90% of pull-down handle travel charges a spring mechanism. Last 10% releases the stored energy and closes the contacts. No teasing.



Expanded trip flexibility meets last-minute load changes in many instances with the existing trip unit.



Subassembly circuit breaker construction permits easier, faster replacement of parts. Six major subassemblies replace 130 separate parts in previous models. A part replacement formerly requiring an all-day overhaul of the circuit breaker may mean only removing and replacing a unit subassembly—a matter of minutes.

Bulletin 6004C tells the complete story of this advanced design switchgear. Ask your local I-T-E representative for a copy today. Or write I-T-E CIRCUIT BREAKER COMPANY, Switchgear Division, 19th & Hamilton Sts., Philadelphia 30, Pa.

I-T-E CIRCUIT BREAKER COMPANY

19TH AND HAMILTON STREETS, PHILADELPHIA 30, PENNSYLVANIA

Do you worry about the cost of wiring that new power distribution system

ON A SUNDAY AFTERNOON?

Sure, new power systems cost plenty — and it takes close figuring to get maximum results at reasonable prices. But you don't have to worry about getting dependable wiring at the right price — an armored cable and rack system using Rockbestos A.V.C.* Interlocked Armored Cable is your best solution. Here's why:

- Rockbestos A.V.C. Interlocked Armored Cable gives more current capacity than cable in conduit or other armored cable.
- Rockbestos A.V.C. Interlocked Armored Cable eliminates the need for costly conduits or ducts — it's easily installed on racks or hangers.
- Less layout time — less installation time mean important dollar savings.
- It permits planning for future installations — again at minimum cost.

Get full details on dollar saving Rockbestos A.V.C. Interlocked Armored Cable — write now for complete specification and application data.

ROCKBESTOS PRODUCTS CORPORATION

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NEW YORK, CLEVELAND, CHICAGO, PITTSBURGH, LOS ANGELES, DETROIT, ST. LOUIS, ATLANTA, DALLAS, OAKLAND, SEATTLE

*A.V.C.-Asbestos, varnished cambric insulated. Single conductors are standard N.E.C. Type AVA power cables.

ROCKBESTOS

A. V. C. Interlocked Armored Cable

For New Buildings, Expanding Existing Circuits, Relocating Old Circuits

MOLONEY

Corrugated Tank Network Transformers

Smaller Size • Ease of Maintenance • Rugged, Durable Tank

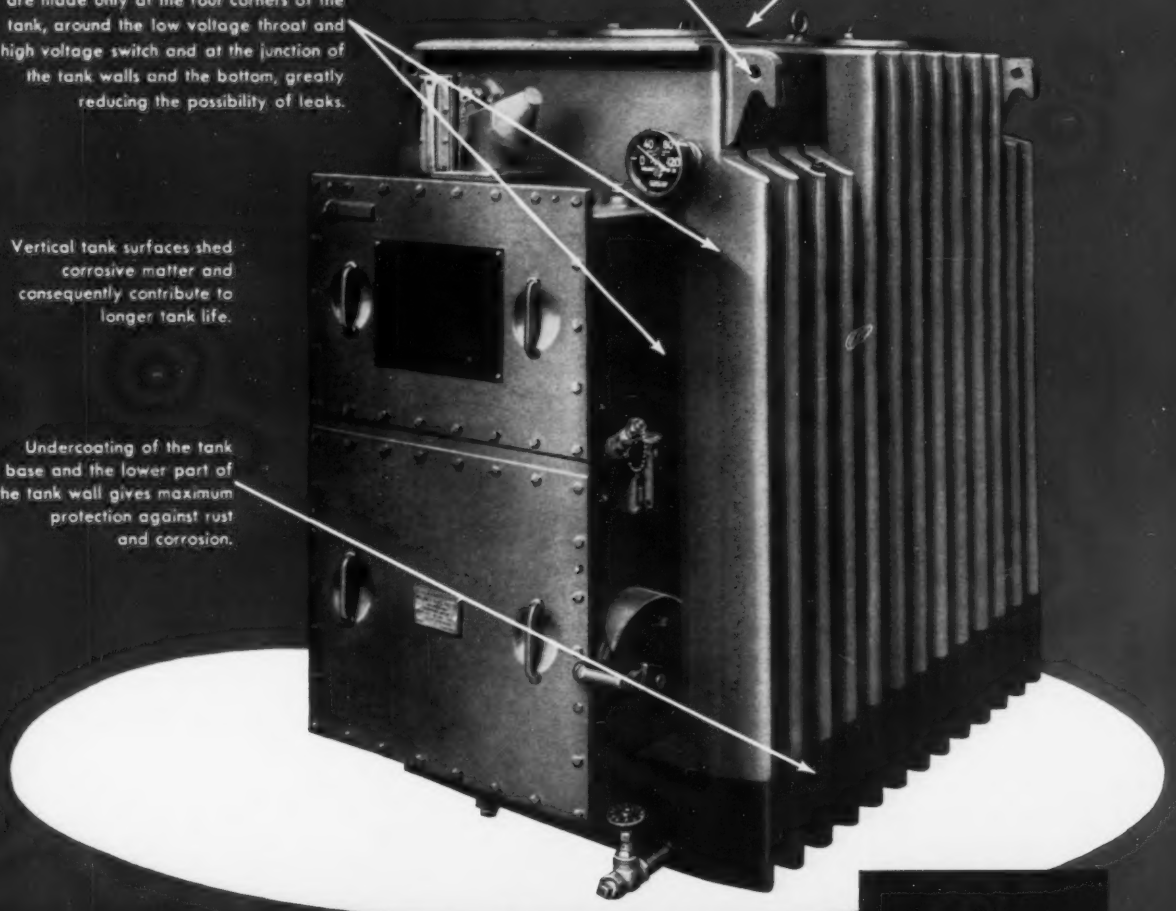
These features help to reduce the cost of your network system. Less original cost results from the use of smaller vaults and the cost of operation is held to a minimum because of the ease of maintenance and the long tank life. This type of design is available in sizes up to 1000 KVA. Corrugated tank network transformers are designed either according to EEI-NEMA Standards or according to your specific requirements.

Tanks may be cleaned from above and repainting is easier as there are no inaccessible areas.

Lifting hooks do not extend beyond the maximum measurements of the tank.

Tank covers and handholes are welded on, absolutely sealing tank against the entrance of moisture.

Corrugated tank wall is made of one piece of steel. Continuous seam welds are made only at the four corners of the tank, around the low voltage throat and high voltage switch and at the junction of the tank walls and the bottom, greatly reducing the possibility of leaks.



Vertical tank surfaces shed corrosive matter and consequently contribute to longer tank life.

Undercoating of the tank base and the lower part of the tank wall gives maximum protection against rust and corrosion.

MOLONEY ELECTRIC COMPANY

Manufacturers of Transformers for Utilities, Industry, and Electronic Applications

FACTORIES AT ST. LOUIS 20, MO. AND TORONTO, ONT., CANADA

he can switch your 12 kv feeders anywhere, any time, under any load with a hook stick using an S&C LOAD INTERRUPTER

The stick-operated S&C Alduti Load Interrupter in use

Sure! The switching of your 12 kv distribution feeders is getting tougher and tougher! Maybe your linemen are living with it, or maybe you are spending a fortune just to get by.

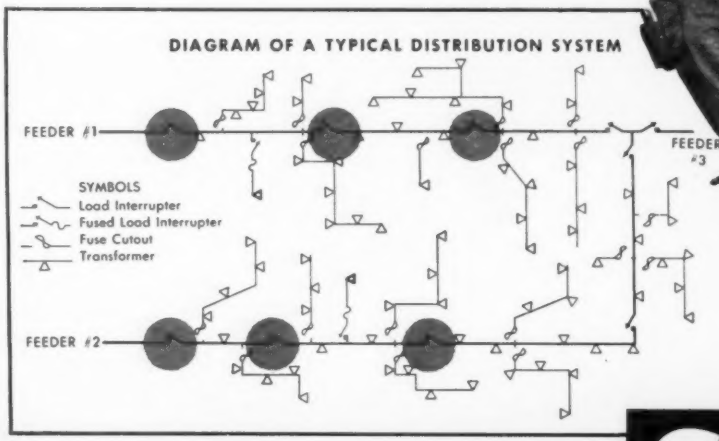
Is there another alternative?

Certainly! A stick-operated S&C Load Interrupter. It can switch positively—under any condition—any load, whether it's line charging current, capacitor charging current, magnetizing current, or full load. And it can be done without the hazards and uncertainties of an external arc. Here's a switch that will keep your linemen happy, and the comptroller, too.

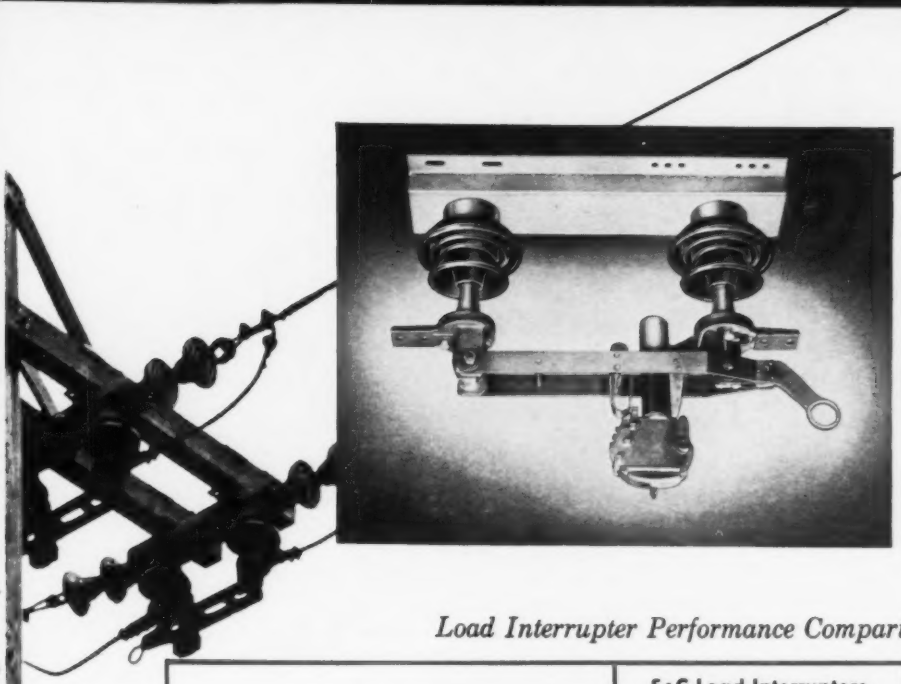
USE IT AT SECTIONALIZING POINTS

On 12 kv *radial* circuits, increased loads have made switching at sectionalizing points virtually impossible with conventional disconnects. On *loop* circuits (right) it's difficult enough where the duty involves only switching in parallel. And if the tie switches are open, hazard-free circuit interruption can be an impossibility.

Here, S&C Load Interrupters will give you safe, positive, circuit interruption on full line voltage and full load current—an advantage under emergency conditions, and a convenience under normal circumstances.



Specialists in High-Voltage Circuit Interruption since 1910



The S&C Load Interrupter, Alduti type; outdoor, single pole, (stick-operated); 14.4 kv, 600 amp. Three-pole, group-operated load interrupters are also available.

Load Interrupter Performance Comparison

PERFORMANCE	S&C Load Interrupters		Conventional Disconnects	
	Stick-Operated	Group-Operated	Stick-Operated	Group-Operated
Interrupt current from parallel sources safely?	YES	YES	DOUBTFUL	DOUBTFUL
Safe to equipment or personnel if inadvertently opened on full voltage (in case loop is open)?	YES	YES	NO	DOUBTFUL
Dump load without opening feeder breaker, or without preliminary unloading?	YES	YES	NO	DOUBTFUL
Multi-pole device controllable from ground (may be required by system practice or other circuits on same pole)?	NO	YES	NO	YES
Interrupt line charging current safely?	YES	YES	NO	DOUBTFUL
Cost?	LOW	HIGHEST	LOWEST	HIGH

The S&C Load Interrupter can switch the circuit without unloading preliminaries and without opening the breakers. The use of S&C Load Interrupters cannot lead to dangerous phase-to-phase or phase-to-ground faults, because there is NO EXTERNAL ARC. Also there is no danger to men or equipment in case of inadvertent operation. The S&C Load Interrupter breaks all load and charging currents instantly and decisively. Besides, you can mount it in any desired position —vertical, upright, or inverted. Write today for Catalog Section 760 on S&C Load Interrupters.

LOAD INTERRUPTERS

S&C ELECTRIC COMPANY

4425 RAVENSWOOD AVENUE • CHICAGO 40, ILLINOIS, U. S. A.

In Canada: S&C Electric Canada, Ltd., 8 Vernico Road, Toronto 14, Ontario

POWER FUSES • DISTRIBUTION CUTOUTS AND FUSE LINKS • LOAD INTERRUPTERS • METALCLAD SWITCHGEAR

Standard-threaded rigid steel conduit is the **only** wiring system approved today by the National Electrical Code as moisture-, vapor-, dust- and explosion-proof for use in hazardous locations and occupancies.

YOUNGSTOWN "BUCKEYE" CONDUIT

. . . gives life-time wiring protection to Zanesville's Good Samaritan Hospital

Good Samaritan Hospital
Zanesville, Ohio

Architect: Dan A. Carmichael, Columbus, Ohio
General Contractor: Knowlton Construction Company, Bellefontaine, Ohio
Electrical Contractor: Electrical Contractors, Inc., Columbus, Ohio

Failure of its all-important electrical system will never interrupt the smooth operation of the Good Samaritan Hospital in Zanesville, Ohio. That's because the builder of this well known institution wisely specified Youngstown's Full Weight Rigid Steel "Buckeye" Conduit for protection of the wiring system from damaging elements such as water, moisture, vapor, dust and dirt.

If the proper functioning of **your** electrical wiring systems—in any location, under any condition—presents a problem, then Youngstown "Buckeye" Conduit should be your specification. Reports from across-the-nation tell us, "It's easier to bend and thread, wire fishing is faster and easier—and its superior corrosion-resistance gives a much longer service life after installation"

Remember, Youngstown is the only producer of rigid steel conduit that controls all its integrated operations from ore mine to finish threading. Thus, you can be sure each length is of the same high quality that has made "Buckeye" Conduit the accepted standard of leading owners, architects and contractors everywhere.

Delivery is no problem—because all leading industrial and electrical distributors carry complete and ample stocks. Why not call today for quick and efficient handling of your current requirements.

QUALITY YOUNGSTOWN SERVICE

THE YOUNGSTOWN SHEET AND TUBE COMPANY
Manufacturers of Carbon, Alloy and Yoloy Steel
General Offices - Youngstown 1, Ohio
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A COMPLETE LINE OF SPACE-SAVING RELAYS

UP TO 4 CONTACTS

2 Normally Open
2 Normally Closed
Measures only
3-5/16" high x 2-5/8" wide!

UP TO 6 CONTACTS

4 Normally Open
2 Normally Closed
Measures only
3-11/16" high x 2-13/16" wide!

NEW!

UP TO 10 CONTACTS

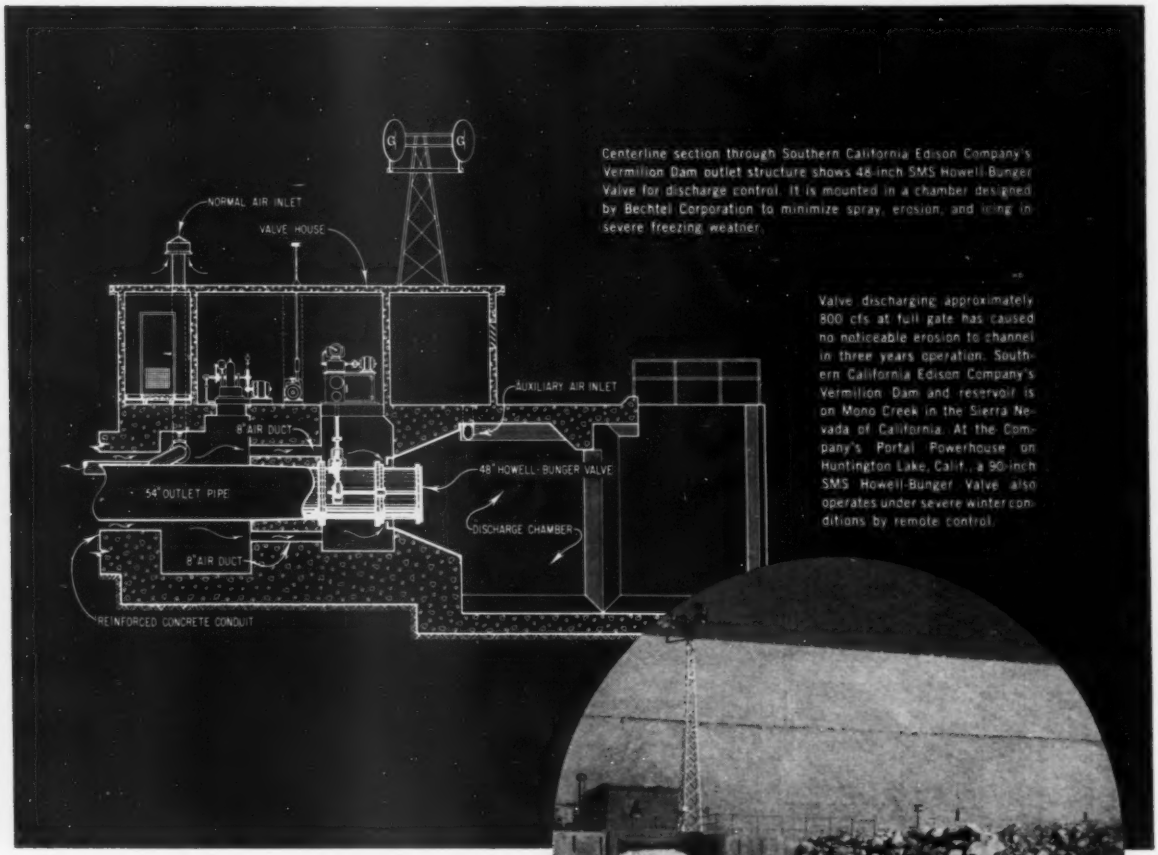
Either 6 Normally Open and
4 Normally Closed or
8 Normally Open and
2 Normally Closed
Measures only
5" high x 3" wide!

- 600 VOLTS • 10 AMPERES • LONG LIFE
- ALL THREE SIZES HAVE IDENTICAL MOUNTING HOLE DIMENSIONS

for the Complete Story, write for Bulletin 8501-D
Square D Company, 4335 Valley Blvd., Los Angeles 32, Calif.

EC&M HEAVY INDUSTRY ELECTRICAL EQUIPMENT...NOW A PART OF THE SQUARE D LINE

SQUARE D COMPANY



Centerline section through Southern California Edison Company's Vermilion Dam outlet structure shows 48-inch SMS Howell-Bunger Valve for discharge control. It is mounted in a chamber designed by Bechtel Corporation to minimize spray, erosion, and icing in severe freezing weather.

Valve discharging approximately 800 cfs at full gate has caused no noticeable erosion to channel in three years operation. Southern California Edison Company's Vermilion Dam and reservoir is on Mono Creek in the Sierra Nevada of California. At the Company's Portal Powerhouse on Huntington Lake, Calif., a 90-inch SMS Howell-Bunger Valve also operates under severe winter conditions by remote control.

Remote Controlled SMS Howell-Bunger Valve at Vermilion Dam Provides ***EASY REGULATION OF FREE DISCHARGE***

A 48-inch SMS Howell-Bunger Valve was chosen for Vermilion Dam to provide close, accurate regulation of releases from 10 cfs to 700 cfs. Remote control was necessary because of the isolated location of the site, and dependable operation and minimum maintenance were required, even in 20° below zero winter weather. Since late in 1954, this Howell-Bunger Valve has operated successfully under all conditions.

Rugged, simply designed and low in initial cost, the SMS Howell-Bunger Valve gives you:

- Free discharge with safe energy dissipation.
- Hydraulic balance without vibration.
- High coefficient of discharge for an energy dissipating valve.
- Minimum cavitation and maintenance.
- Simplicity of operation.
- Only one moving part in contact with stream.
- Discharge into atmosphere or under submerged conditions.

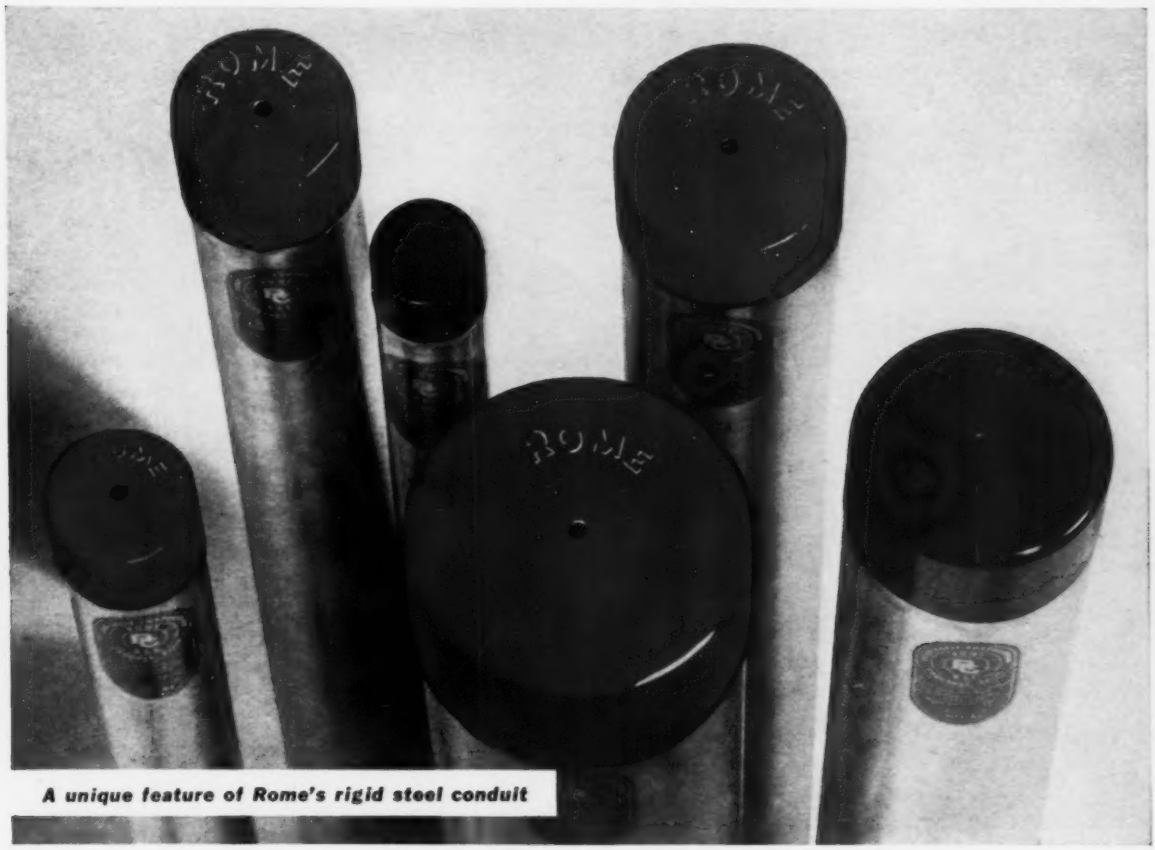
To obtain complete information, write to S. Morgan Smith Company, York, Pennsylvania.

S. MORGAN SMITH SMS **HYDRODYNAMICS**

More Power To . . . LIVE BETTER ELECTRICALLY

AFFILIATE: S. MORGAN SMITH, CANADA, LIMITED, TORONTO

Rotovalves • Ball Valves • R-S Butterfly Valves • Free-Discharge Valves • Liquid Heaters • Pumps • Hydraulic Turbines & Accessories



A unique feature of Rome's rigid steel conduit

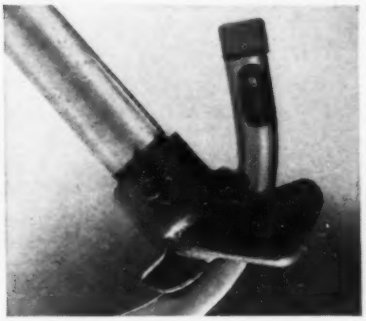
● Blue . . . 1", 2", 3", 4", 5", 6" ● Black . . . ½", 1½", 2½", 3½" ● Red . . . ¾", 1¼"

How you can save up to 20¢ per stub-up with Rome's color-coded steel thread protectors

Do your men cap conduit stubs in the usual but *costly* way?

Do they place a seal over the stub and cap it with a bushing? This is one way of doing the job, but the one or two minutes it takes can cost you up to 20¢ *every time a stub is capped.*

Now Rome's rigid steel conduit comes to you with unique *steel* thread protectors that eliminate capping time altogether.



Rome's color-coded thread protectors help you save three ways:

1. You can simply bend a stub-up with the Rome thread protector in place, then leave it. No time lost in searching for seals and bushings to protect the conduit from concrete, dirt or stones.
2. Rome's thread protectors are made of *steel* to prevent damage to the threads. They fit snugly enough to stay on the conduit, yet are easily removed without damaging either the threads or the protector itself.
3. You can see the piece of conduit you want at twenty paces. Rome's thread protectors are color-coded to give you easy and immediate size identification. No time is lost searching through stacked conduit for a particular size.

These thread protectors are just one of the features that make Rome rigid your best rigid conduit buy. Specify Rome's conduit for your next job. Contact your Rome Cable representative for more information—or write to Department 947, Rome Cable Corporation, Rome, New York.

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ROME CABLE
CORPORATION

When you are asked to help out with a customer's lighting problem, you'll find us ready and willing to discuss with you the latest ideas, methods and information available from any one source,—Graybar!

For assistance in the selection of equipment for any lighting system . . .

MERCURY ☐ INCANDESCENT ☐ or FLUORESCENT ☐ . . . call Graybar

Every working day brings you questions from architects, electrical contractors, commercial establishments and industrials concerning the right lighting source and equipment to use for some particular installation. Always remember, you can supplement your own broad knowledge and experience through that of our Lighting Specialists,—men who have contributed to the planning of thousands of installations across the country. Graybar's roots are deep in the lighting industry, and ours is a mutual interest—better lighting for all.

Next time you have a knotty lighting problem, call your nearby Graybar office. Back up your dealers and contractors with the best of the current ideas selected from up-to-date developments of the nation's leading equipment manufacturers whom Graybar represents. You'll help build your load through the kind of lighting that will contribute to better production schedules in industry, greater sales for your merchant customers, and greater living enjoyment in homes in your area.

690-82

CALL GraybaR FIRST FOR "Graybar Everything Electrical" "GraybaR ELECTRIC COMPANY"

GRAYBAR ELECTRIC COMPANY, INC., 420 LEXINGTON AVENUE, NEW YORK 17, NEW YORK, IN OVER 130 PRINCIPAL CITIES

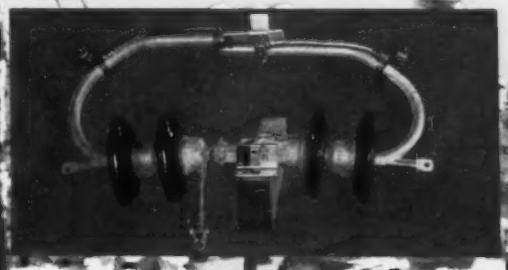
KPF switches operate smoothly, surely in all weather!

What's *your* weather? Arctic cold? Tropical rain? Parching desert sun? KPF switches operate unfailingly under all conditions. Their exclusive mechanical design permits a slight amount of movement before opening the switch so even extreme ice formations can be cracked off easily. Warpage cannot jam the switch, and lack of lubrication is never a problem.

KPF phase units consist of two rigid dead-end assemblies with rigid jumpers forming the switch arms. One is stationary, the other rotates to make or break the circuit. There's no delicate, complex mechanism to malfunction.

Their utmost design simplicity means KPF switches weigh less, install faster without extra bracing, need no servicing, cost less. They have proved themselves in almost 50 years of major system operation, on lines carrying 7.5 to 110 KV and amperages from 200 to 600 amperes.

Get the details, then order a test installation and see for yourself.



For catalog, complete specifications, write direct

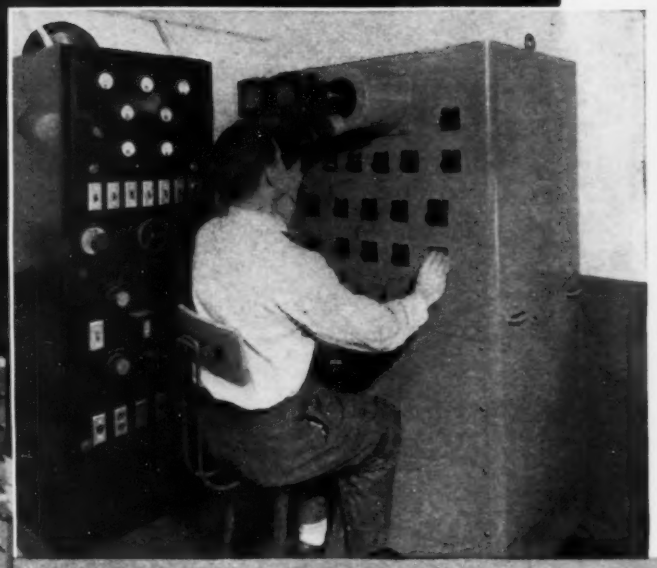
KPF
AIR BREAK SWITCHES
Standard for nearly half a century

3618

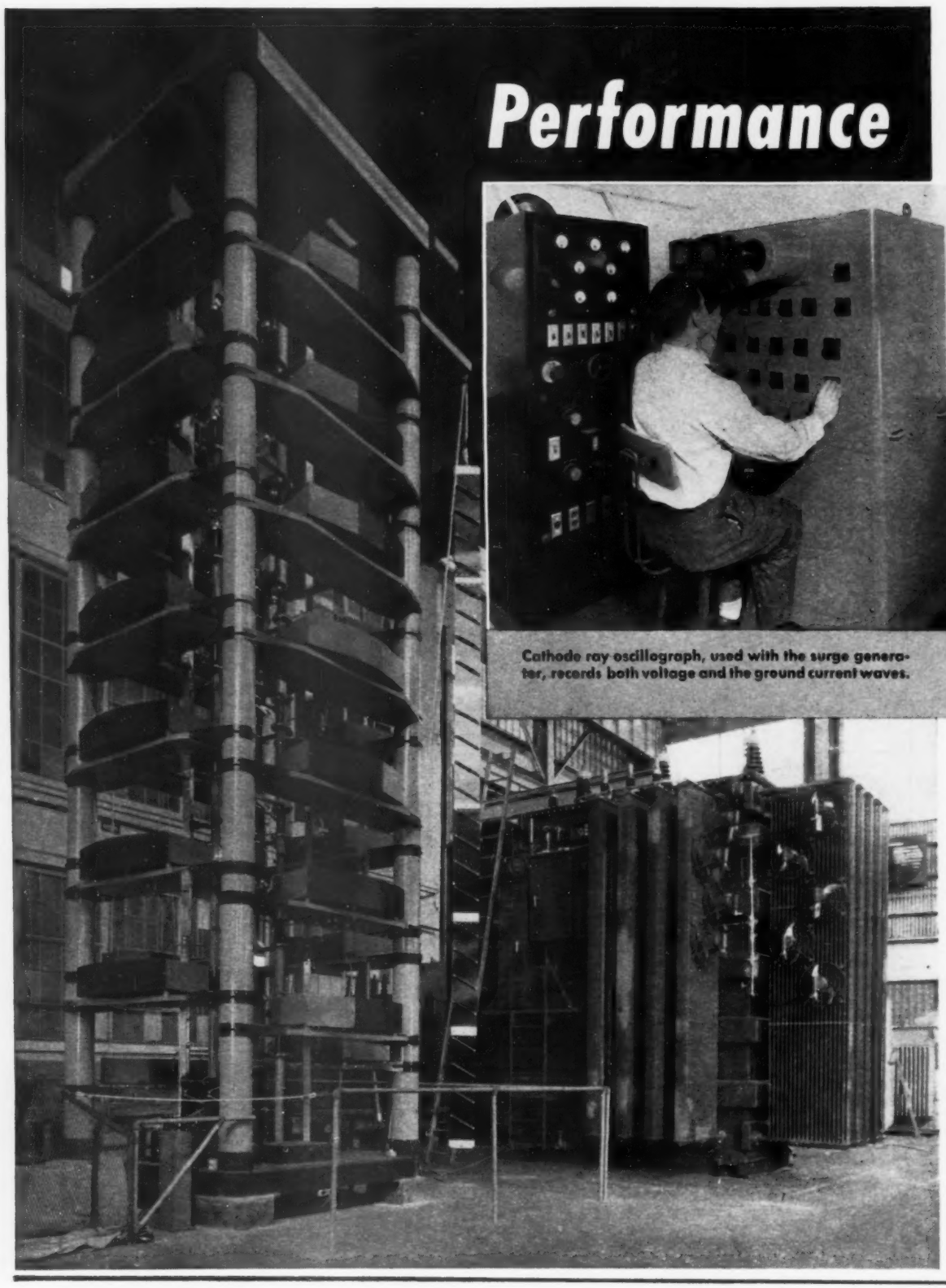
KPF ELECTRIC COMPANY

Dept. W, 1624 E. Alpine Avenue
Stockton 5, California

Performance

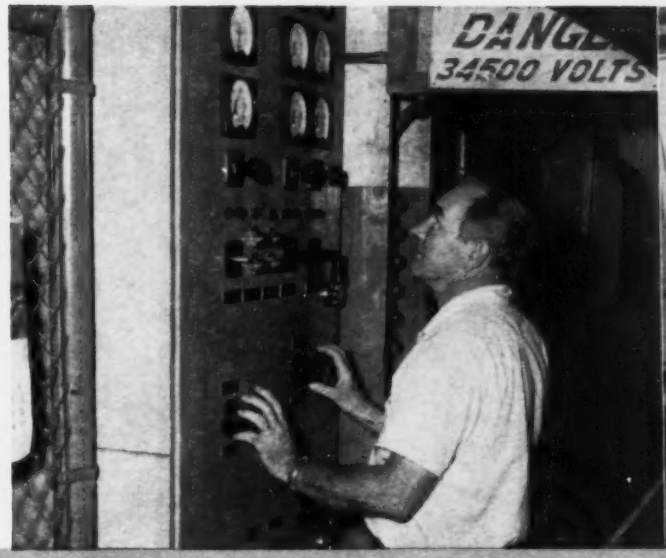


Cathode ray oscillograph, used with the surge generator, records both voltage and the ground current waves.

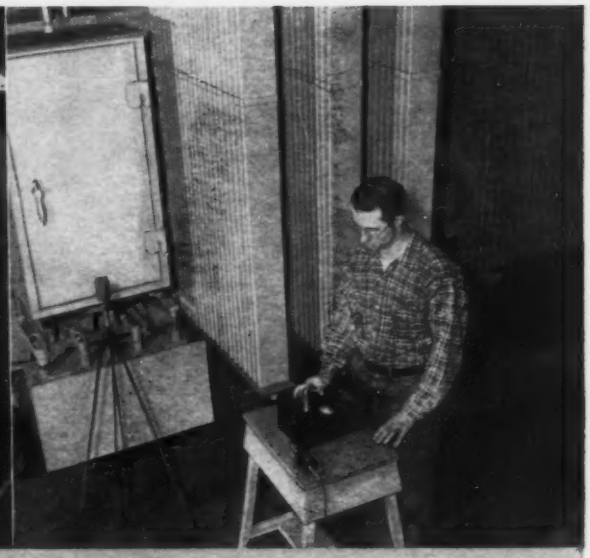


This surge generator is capable of producing up to 3 million volts at 25,000 amperes, and is used for impulse testing all voltage classes of transformers.

stability proved by tests...



Control panel for a 300 cycle generator used for induced voltage testing in accordance with the commercial standards of ASA and NEMA.



This large power transformer is being given an audible sound level test in accordance with NEMA test procedures.

Wagner Power Transformers are test-proved to give better service

The performance stability of Wagner Power Transformers is outstanding. That's because quality is designed and built into these transformers by specialists with years of transformer engineering and production experience.

These specialists insist on the use of only the highest quality materials — on carefully controlled production methods — and on constant inspections and tests to make doubly sure that their transformers will have the kind of performance stability that means better service on your system.

Ask your nearby Wagner Sales Engineer to show you the Wagner motion picture "Transformers in the Making" or, if you prefer, write for Bulletin TU-16D.

Wagner Electric Corporation
SERVING INDUSTRY SINCE 1891

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ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES • AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC

NO MORE WASTE when you cut a length of new SLIPKNOT #7 PLASTIC ELECTRICAL TAPE . . . and no more struggling to cut it, either. Because Slipknot's newly developed all-plastic tape cutter (pat. pending) rides the roll, and gives a quick clean cut when and where you want it. No more stretching and thinning the next several inches. Try new SLIPKNOT #7 with ZF-90 — Plymouth's formula for total adhesion — on your next job. You'll like it, and you'll appreciate the cutter, packed free* in every 66-foot can.

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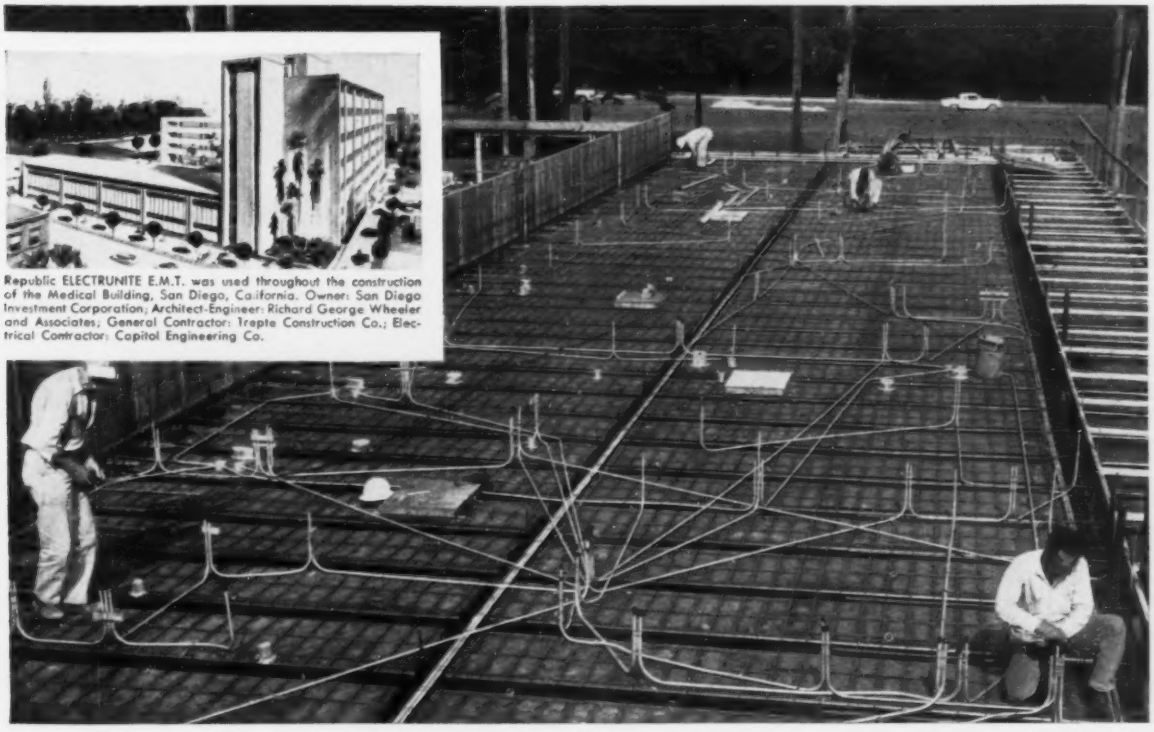
PLYMOUTH RUBBER COMPANY, INC.

DIVISION 14 Makers of SLIPKNOT FRICTION TAPE CANTON, MASSACHUSETTS



Republic ELECTRUNITE E.M.T. was used throughout the construction of the Medical Building, San Diego, California. Owner: San Diego Investment Corporation; Architect-Engineer: Richard George Wheeler and Associates; General Contractor: Trepte Construction Co.; Electrical Contractor: Capitol Engineering Co.

Republic ELECTRUNITE E.M.T. . . . quality controlled from ore to job site . . . is the reason why THE BEST COSTS LESS INSTALLED

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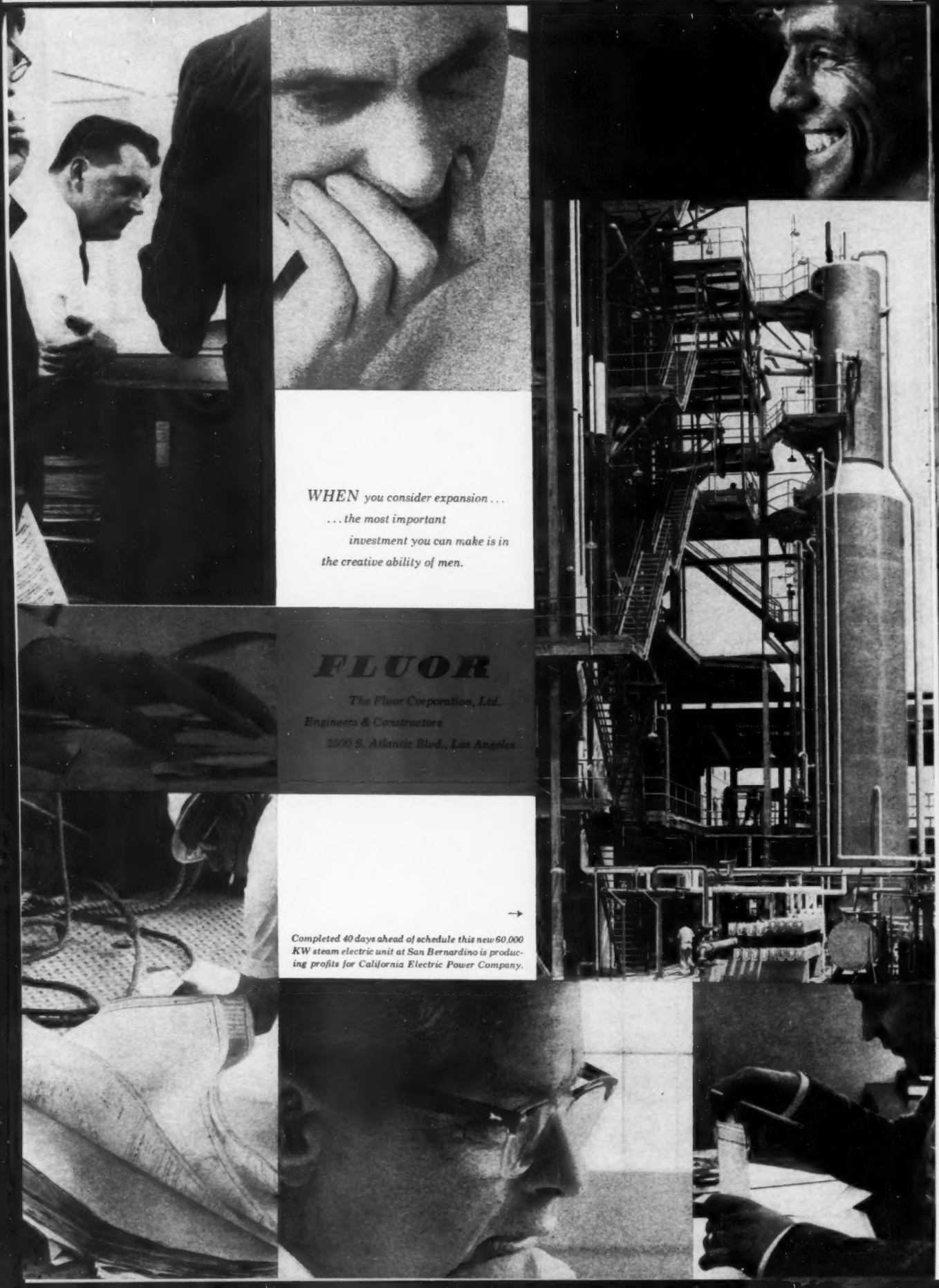


WHEN you consider expansion . . .
. . . the most important
investment you can make is in
the creative ability of men.

FLUOR

The Fluor Corporation, Ltd.
Engineers & Constructors
2500 S. Atlantic Blvd., Los Angeles

→

Completed 40 days ahead of schedule this new 60,000 KW steam electric unit at San Bernardino is producing profits for California Electric Power Company.

The Fifty Largest Utilities as listed in the 1957 FORTUNE DIRECTORY
★ American Tel. & Tel. (New York)
★ Pacific Gas & Electric (San Francisco)
★ Consolidated Edison of New York
★ Commonwealth Edison (Chicago)
★ American Gas & Electric (New York)
★ Tennessee Gas Transmission (Houston)
★ Public Service Elec. & Gas (Newark, N. J.)
★ Southern California Edison (Los Angeles)
★ Southern Co. (New York)
★ Detroit Edison (Detroit)
★ Philadelphia Electric (Philadelphia)
★ Niagara Mohawk Power (Syracuse, N. Y.)
★ General Telephone (New York)
★ El Paso Natural Gas (El Paso, Texas)
★ Columbia Gas System (New York)
★ General Public Utilities (New York)
★ Consumers Power (Jackson, Mich.)
★ American & Foreign Power (New York)
★ American Natural Gas (New York)
★ United Gas (Shreveport, La.)
★ Texas Utilities (Dallas)
★ Middle South Utilities (New York)
★ Pacific Lighting (San Francisco)
★ Texas Eastern Transm. (Shreveport, La.)
★ Consolidated Natural Gas (New York)
★ Central & South West (Wilmington, Del.)
★ New England Electric System (Boston)
★ Pennsylvania Power & Light (Allentown)
★ Union Electric (St. Louis)
★ Ohio Edison (Akron)
★ Virginia Electric & Power (Richmond)
★ Peoples Gas Light & Coke (Chicago)
★ Northern States Power (Minneapolis)
★ Cleveland Electric Illum. (Cleveland)
★ West Penn Electric (New York)
★ Duke Power (Charlotte, N. C.)
★ Long Island Lighting (Mineola, N. Y.)
★ Baltimore Gas & Electric (Baltimore)
★ Duquesne Light (Pittsburgh)
★ Northern Natural Gas (Omaha, Neb.)
★ Wisconsin Electric Power (Milwaukee)
★ Transcontinental Gas Pipe Line (Houston)
★ Pennsylvania Eastern Pipe Line (New York)
★ Public Service of Indiana (Plainfield)
★ Florida Power & Light (Miami)
★ Illinois Power (Decatur, Ill.)
★ Western Union Telegraph (New York)
★ Boston Edison (Boston)
★ New York State Electric & Gas (Binghamton)
★ Cincinnati Gas & Electric (Cincinnati)
© 1957 Time Inc.
Among the 50 largest utilities, only one electric or telephone utility is a Preformed prospect...
the rest are Preformed customers
In July, 1947, Preformed Line Products Company didn't have a customer; all the electric and telephone utilities were prospects. Today, the situation is almost completely reversed.
For example, in FORTUNE's list of the "Fifty Largest" utilities, only one of the electric and telephone utilities mentioned is still a prospect; all the rest are now Preformed customers. In other words, the Preformed principle of using preformed helical rods for line accessories has gained almost complete acceptance in only 10 years.
If you are among the few utilities not utilizing Preformed, you might ask "Why?". PREFORMED LINE PRODUCTS COMPANY, 5349 St. Clair Avenue, Cleveland 3, Ohio. Cable Address: Preformed-Cleveland
...in 10 years the leading manufacturer or armor rods, dead-ends, Guy-Grip dead-ends, splices and other line accessories.
PLP
You can look up to Preformed

Linemen like this Feature...

KUHLMAN transformers are WHITE inside

Look, Bill. All Kuhlman pole type transformers have white interiors like this.
You can see every component clear down to the bottom of the tank. Sure makes inspection easy.
Right. It'll be a snap to change a connection or a tap, even when you're on the pole and using a flashlight.
Well, this one passes my inspection. Let's hoist her up.

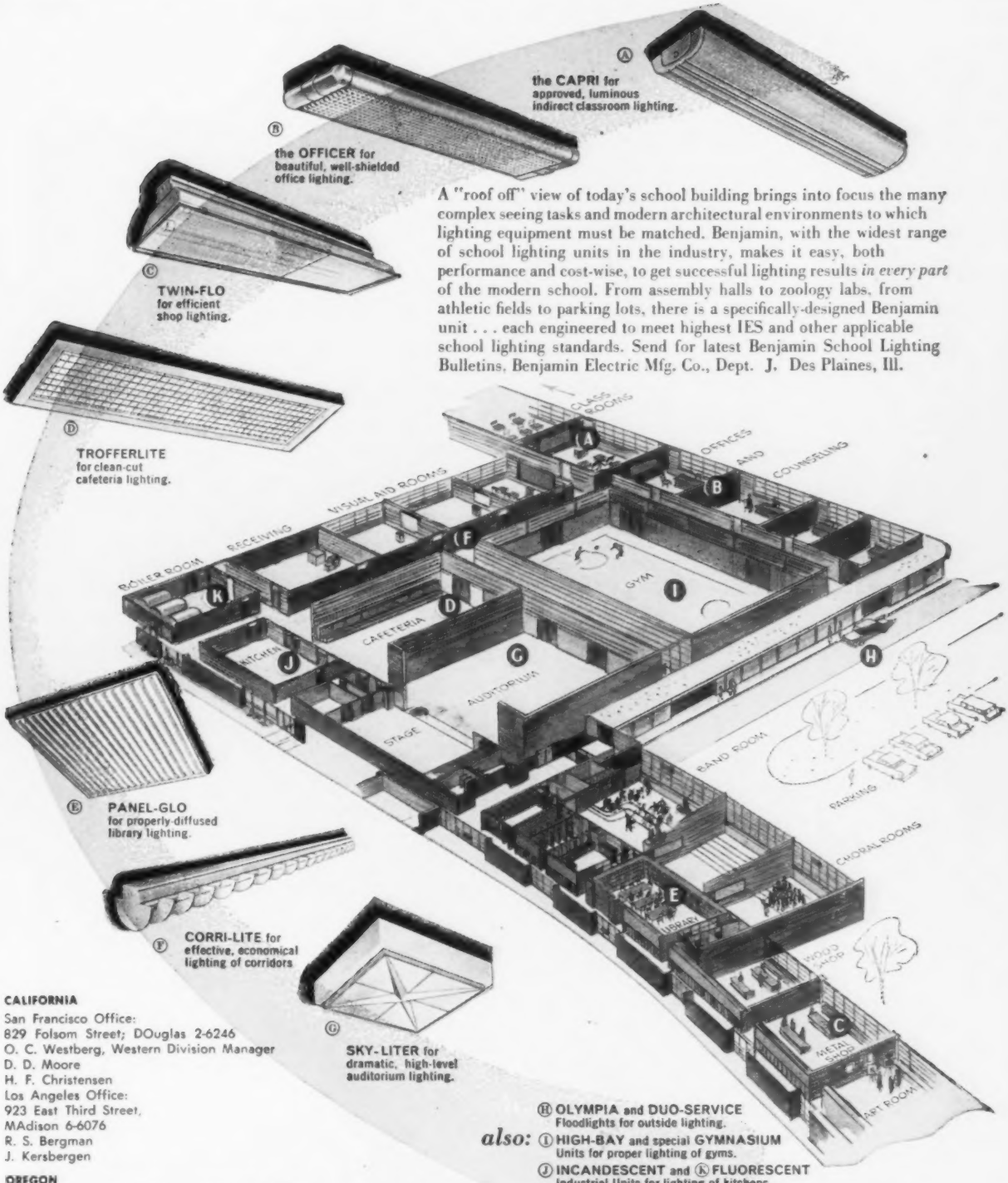
White interiors—a Kuhlman exclusive—make periodic inspection faster and surer by helping the lineman see clearly all the way to the bottom. This much-appreciated feature doesn't add a penny to the cost, however. Kuhlman's dual-flow paint system sprays exterior gray and interior white simultaneously, preparing the tank for the bake oven in one operation.

Look into a light, *white* Kuhlman transformer. You'll see the advantage of white interiors right away!

KUHLMAN ELECTRIC COMPANY

General Offices: Birmingham, Michigan

WESTERN DIVISION • SALINAS, CALIFORNIA



A "roof off" view of today's school building brings into focus the many complex seeing tasks and modern architectural environments to which lighting equipment must be matched. Benjamin, with the widest range of school lighting units in the industry, makes it easy, both performance and cost-wise, to get successful lighting results *in every part* of the modern school. From assembly halls to zoology labs, from athletic fields to parking lots, there is a specifically-designed Benjamin unit . . . each engineered to meet highest IES and other applicable school lighting standards. Send for latest Benjamin School Lighting Bulletins. Benjamin Electric Mfg. Co., Dept. J. Des Plaines, Ill.

also: Ⓗ **OLYMPIA and DUO-SERVICE** Floodlights for outside lighting.
Ⓘ **HIGH-BAY and special GYMNASIUM** Units for proper lighting of gyms.
Ⓙ **INCANDESCENT and Ⓚ FLUORESCENT** Industrial Units for lighting of kitchens, boiler rooms, and other special locations.

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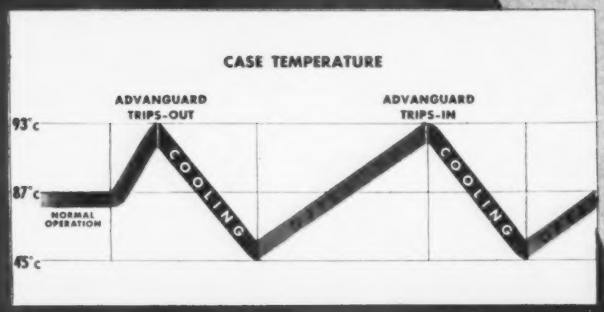
BENJAMIN
. . . always the source of good lighting
Now Setting the Pace in COMMERCIAL LIGHTING

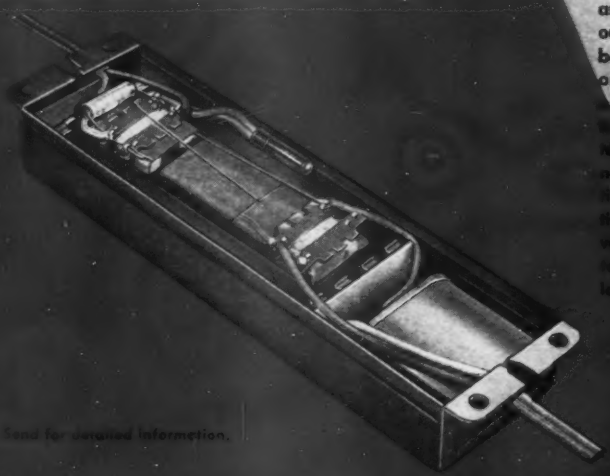
STOP BALLAST OVERHEATING

HERE'S WHY **ADVAN** *guard* **CAN INCREASE BALLAST LIFE**



The life of a fluorescent lamp ballast depends on maintaining a normal operating temperature. For each 10° C. increase over normal operating temperature, ballast life is cut in half. Each subsequent 10° C. rise cuts ballast life again in half and increases costs accordingly.

ADVAN-guard, a thermally-actuated automatic reclosing protective device is sealed in the ballast housing and is preset to automatically 'trip-out' whenever the fluorescent lamp ballast operates at abnormal current or temperatures. When the current or heat decreases to normal operating temperatures, this protector resets automatically and the ballast resumes normal operation. If overheating continues, ADVAN-guard protection continues. Thus ADVAN-guard, by preventing ballast operation at abnormal temperature, can add years to ballast life.



Send for detailed information.

The Heart of the Lighting Industry®

ADVANCE®

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World's Largest Exclusive Manufacturer of Fluorescent Lamp Ballasts

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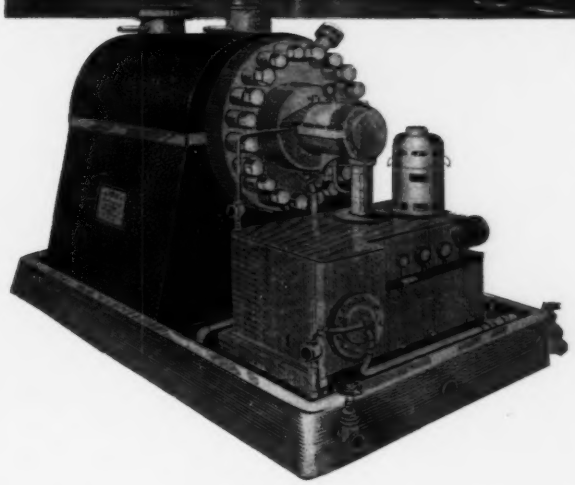


PACIFIC BOILER FEED PUMPS

CONTINUOUS POWER...a *must* in Southern California Edison's giant El Segundo steam station. Three Pacific boiler feed pumps were placed in operation for unit No. 1 in 1955. Two more Pacific pumps were selected and went on the line for unit No. 2 in 1956. The combined generating capacity of the two units is 350,000 kilowatts. These Pacifics, each delivering 685,000 lbs./hr. of 360°F. feed water at 2350 PSIG, unfailingly serve Southern California Edison's El Segundo plant needs. Whenever continuous boiler feed service is an absolute must... then nothing but the best, most dependable service will do... Pacific Boiler Feed Pumps!

Write for Bulletin 122

PACIFIC PUMPS INC.

HUNTINGTON PARK CALIFORNIA

Offices in all Principal Cities

ONE OF THE DRESSER INDUSTRIES

PACIFIC®

BF-26

The "Man on the Ladder"
the complete line that offers

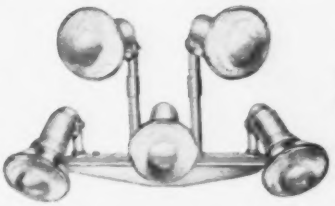
ELECTRIC MANUFACTURING COMPANY

ELECTROLEX KILLARK SPEEDOLEX

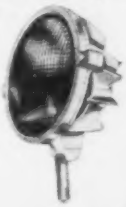
Vandeventer and Easton Aves. **St. Louis 13, Missouri**

talks about KILLARK fixtures
SELECTION...SAFETY...
PEAK EFFICIENCY...MODERN DESIGN

FOR HAZARDOUS LOCATIONS, from my experience, Killark Fixtures offer the ultimate for both my client and myself in dependable protection, better lighting and easier maintenance. Take this Explosion-Proof Fixture shown here, for example. You can see from the design how easy it is to relamp without tools. Wattage can be quickly changed on the spot, too, by a simple replacement of the adaptor. Snug-fitting, air-cooled aluminum body and shock-proof globe all mean on-the-job safety at all times.



FOR MY CLIENTS WHO WANT CLEAR, BRIGHT, CONTROLLED LIGHT, as for loading-dock or yard areas, I always suggest Killark Cluster-Lites. Their sealed Beam Lamps are adjustable in any direction, completely weatherproof, no reflectors to service. Rustproof aluminum offers years of uninterrupted service.



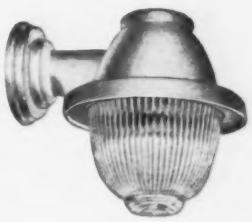
FOR "BEAUTY SPOT" AND HIGH-POWERED FLOOD LIGHTING, Killark also offers a complete selection of spotlights. They offer a powerful, compact source of light: flexible aiming, easy maintenance, minimum cleaning. The rustproof, non-staining aluminum design also assures cool operation for longer lamp life.

THE COMPLETE LINE OF KILLARK DUST-TIGHT FIXTURES boasts a graceful "ledge-free" design that prevents the dangerous accumulation of dust particles. Close-fitting lamp parts, carefully machined and skillfully assembled, positively exclude dust. Killark makes a complete series in ceiling, bracket and pendant styles.

THE KILLARK CONCH LIGHT is further proof that Killark brings you complete selection under one name. Here is subdued lighting at its dramatic best—attractively styled in gleaming, never-dulling aluminum and very effective for doorways, corridors and outdoor theatres.

VAPOR-TIGHT FIXTURES BY KILLARK are not only vapor-proofed inside but weather-proofed outside. They are made of never-rusting, non-corroding Alumalloy, a special Killark aluminum alloy. I know they can take any kind of climate or humidity, because I've installed them on docks, in railroad yards, underpasses and bridges and indoors in cold storage plants, breweries and dairies. They come large or small, too: from 60w to 500w sizes.

THIS NEW DEKORATIVE LIGHT is a handsome combination of weather-proofed lighting, plus sleek, streamlined beauty. It's tastefully styled in non-rusting, non-corroding Alumalloy (an exclusive with Killark) so that it's attractive for inside use, practical for outdoor use.



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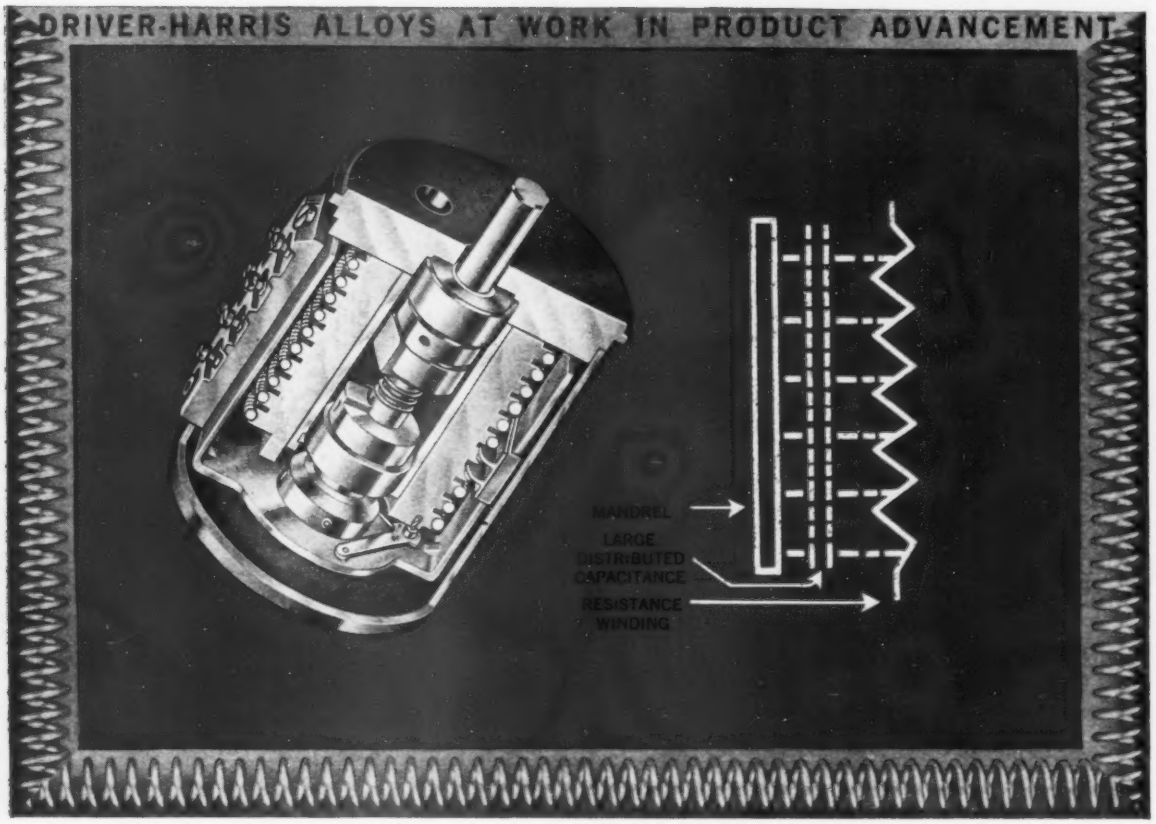


Phase Shift Compensation Eliminated In New HELIPOT® Precision Potentiometers

SPECIAL D-H ALLOYS MAKE AIR-CORE WINDINGS PRACTICAL!

Helipot's purpose in designing its new, air-core wound series 7700 Potentiometers was to make possible operation at higher frequencies with 0° phase shift—thereby eliminating compensation circuitry.

In nearly all multi-turn potentiometers, resistance wire is wound on an insulated copper-wire mandrel. This type of mandrel is used because it has uniform diameter, good heat conductivity and high thermal capacity. However, a disadvantage of such construction is the relatively large distributed capacitance between the resistance winding and the mandrel. When such a potentiometer is used as an AC voltage divider, the output generally differs in phase and magnitude from the desired output. This interferes with the effective use of high accuracy potentiometers unless compensation is applied somewhere in the circuit.

Helipot engineers desired to eliminate these problems by eliminating the copper-wire mandrel. But the elimination of the mandrel also eliminated the support for the winding. Needed, therefore, was a type of wire that would make a self-supporting air-core winding.

At Helipot's request, Driver-Harris went to work with these specifications: The wire must be of dependable uniform hardness so that in stretching it, equal spacing between turns is obtained, free of creep. This is essential to linearity. The wire also must be of unvarying diameter for uniform resistance. And its surface must be extremely clean—free of oxide coating to minimize contact "noise".

Driver-Harris produced the wire—a special hard-drawn form of Karma* and Nichrome* V. And Helipot produced its new 10-turn series 7700 potentiometers in a resistance range from 200 to 5000 ohms. With this radically new air-core winding, linearity approaches the resolution of the unit without resort to padding or shunting. And phase shift in AC circuitry is reduced to less than 0.1°.

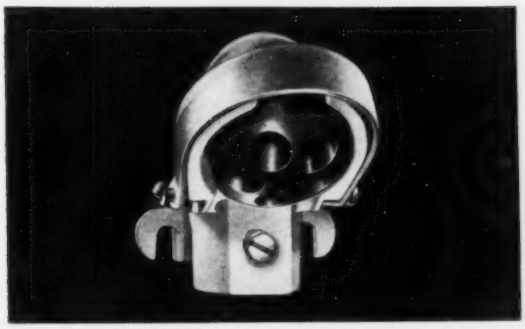
Since 1899, Driver-Harris has produced 132 special-purpose alloys in just this fashion—in answer to a particular problem and extraordinary specifications. If your own engineering and product development plans currently hinge upon a special alloy—why not bring your problem to Driver-Harris. Your inquiry is invited.

*T.M. REG. U.S. PAT. OFF.

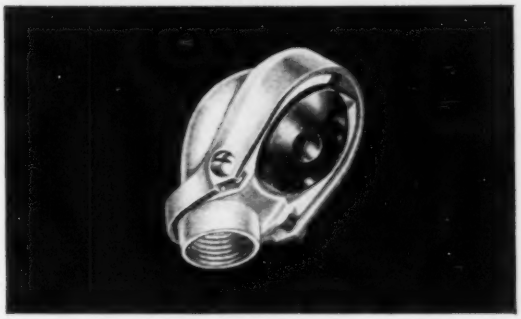
Driver-Harris Company*

HARRISON, NEW JERSEY • BRANCHES: Chicago, Detroit, Cleveland, Louisville
Distributor: ARGUS-CAMPBELL, INC., Los Angeles, San Francisco • In Canada: The B. GREENING WIRE COMPANY, Ltd., Hamilton, Ontario

MAKERS OF THE MOST COMPLETE LINE OF ALLOYS FOR THE ELECTRICAL, ELECTRONIC, AND HEAT-TREATING INDUSTRIES



"SPECIAL" ENTRANCE CAP for S.E. cables. With 5-hole insulator. Many inspection authorities require the use of special cables to meet particular requirements such as looking down a yard pole to meter box with a 5-conductor cable. Gedney, accordingly, designed this special entrance cap. Malleable iron; hot dip galvanized.



THREADED CONDUIT ENTRANCE CAPS Like most other Gedney entrance caps, this one is made of malleable iron to prevent breakage... hot dip galvanized for maximum service life. Sizes range from ½" to 6".

ENTRANCE CAPS for S.E. Cables—with key hole mounting bracket. Easy to assemble—cable slips into cap and is securely held by clamping shoe. Has split insulator and well bushed holes. Overlapping cover protects cables from weather. Malleable iron, hot dip galvanized.

Cross the threshold to lower costs...with GEDNEY ENTRANCE CAPS

Malleable Iron–Hot Dip Galvanized

THESE ENTRANCE CAPS install faster—and cut your *final* costs right down to rock bottom. Like all Gedney Fittings they're accurately machined and threaded...smooth finished, with no burrs or metal particles. On top of that, the Gedney line includes many improved design features that bring extra efficiency and labor savings. For fittings that bring today's lowest installed cost, specify Gedney!

GEDNEY FITTINGS FIT

GEDNEY
ELECTRIC COMPANY

GEDNEY

RKO BLDG. • RADIO CITY • NEW YORK 20
Foundry, Factory and Shipping Point: Terryville, Conn.

ELECTRA'S HUSBAND

AS WE sat down to the dinner table, I noticed that Electra looked particularly smug. That could only mean that she figured she had the whip hand on the dinner conversation and her opening remark left no doubt of it.

"I had a letter from a friend of yours today," she remarked. "Actually it wasn't so much of a letter as it was a note with a speech that Dave wanted me to read."

"That's nice," I replied noncommittally, helping myself liberally to the beef stroganoff and making a mental note that Dave was even a smarter salesman than I had thought him to be. This approach could be nothing more than an insidious way of getting Electra to sell me one of Dave's ideas.

"It was about women and their importance in the scheme of things," Electra continued, "and you might show just a little bit more interest."

"That's not very revolutionary, Electra. You know that I have always cherished womanhood as the prize possession of civilization." This was playing it in a very low key but under circumstances such as this a cautious approach has saved me many trap scars in the past.

"No, no," exclaimed Electra. "You just don't understand. Chivalry, I agree, is one of your better attributes but appreciation seems to be universally lost in a male blind spot. We women are important and it's high time that you business men realized we could play a much larger role in the scheme of things if we were approached the right way."

Electra was getting warmed up to the subject. It was time for me to put up a show of resistance. "Now, Electra," I said mildly, "you know that business men have long recognized the power of women's decisions. Why, advertising agencies and survey organizations have spent millions of dollars in recognition of the fact that the housewife is the dominant influence in consumer buying. Philosophers have come up with batches of statements like the old saw 'The hand that rocks the cradle is the hand that rules the world.' Why practically our whole economy is geared around one all-out effort to make life easier and less laborious for you women. And if that isn't a measure of appreciation, I'll eat all the rest of the beef stroganoff."

"Don't you dare." Electra quickly moved all of the more tasty dishes out of my reach. "After the Christmas season you're two months over-

Women!

drawn on your calorie account already. Besides that's not what I'm talking about when I say women are important. I'll admit you men make an all-out effort to sell us women the tangible good things in life but we're pretty much ignored when you try to sell ideas. Maybe you think we're too silly and frivolous to appreciate a philosophical or an ideological approach.

"For example, you come home and rant about the preservation of the free enterprise system and the sanctity of the profit motive. I've been to conventions with you a hundred times when you men get up and talk to each other about how to stop the drift toward socialism. You are always around trying to raise money for this campaign and that campaign to sell the people that liberty really depends upon the preservation of individual incentive. The trouble with all these efforts is either that they always seem to end up with you talking to yourselves or they make use of a shotgun when a rifle would be better.

"Now that's a pretty broad statement," I challenged. "I'd like to hear more about this rifle approach."

"I was hoping you would ask me that," smirked Electra, "because it just so happens that this talk that Dave sent me gave me a real good idea that I'll pass along to you for free—or almost free. Women, whether they know it or not, have the biggest stake of all in the preservation of the free enterprise system. Why don't you concentrate your campaigns and advertisements along those lines to appeal directly to the women of the nation? After all they are the most receptive audience that you have and, while I hate to admit it, they are pretty easy to sell."

"How did you figure all that out, Electra?" I asked.

"Well, I didn't exactly figure it out but this speech I read said that women owned 51% of the stock of all corporations in the country, that they were the beneficiaries of 80% of all the private life insurance payments, that they own a majority of all the assets in the mutual savings banks of the country and, the most significant of all, that women are better voters than men. It seems to me that you couldn't have a more receptive audience for stories about the free enterprise system than this big group of females who rely on the profit system for a good share of their livelihood. Furthermore, most of them get really emotional when you talk about the heritage they're leaving their children."

"Now that's a real intelligent analysis," I complimented. "It very well could be that a more direct approach to the women's interests would pay off. At least we certainly need some new angle that will get faster results.

"Why don't you talk it up among your associates?" enthused Electra. "You'd be surprised what we women could do once we were organized."

"Oh no I wouldn't," I sighed. "We poor men all have had experience of what you can do once you set your minds to it. But we males do have one consolation."

"What's that?" asked Electra.

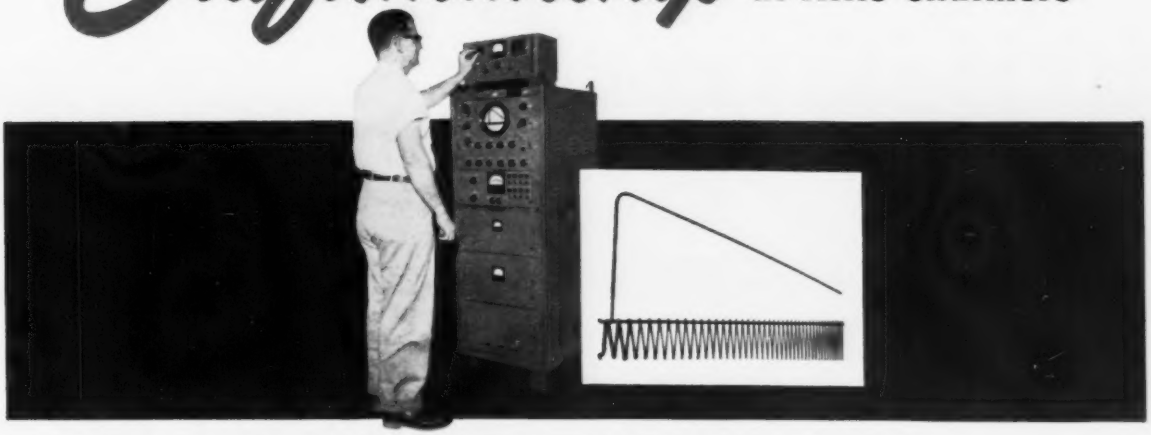
"Only that there are about 2,000,000 more women than men in the country today—and economists say that there are certain advantages accrue to the holders of scarce articles. Now what's for dessert?"

In Memoriam

The staff of Electrical West and all of her many friends in the electrical industry mourn the passing of Mary Tenney, wife of George Tenney, and the inspiration for Electra—our industry's lovable conscience for so many years.

It is a tribute to a great lady that her warm, gentle personality will be long remembered by the people of the electrical West.

Craftsmanship at Allis-Chalmers



Automatic Fault Detector Improves...

Impulse Testing

of Distribution Transformers

The new Automatic Fault Detector, used by Allis-Chalmers, minimizes chance for human error in impulse testing of distribution transformers . . . adds assurance that the overall strength of insulation meets all standards. The fault detector signals the impulse test operator with a ringing bell and flashing red light. Combining automatic fault detection with an experienced tester's visual inspection of the *oscilloscope* assures that even the smallest fault will be revealed. Liquid filled distribution transformers from 3 to 500 kva are impulse tested by Allis-Chalmers.

Production-Line Impulse Testing Originated by Allis-Chalmers

Ten years ago Allis-Chalmers initiated impulse testing for pole type distribution transformers. Expanded to embrace all distribution transformers, the program includes both conventional and self-protecting designs.

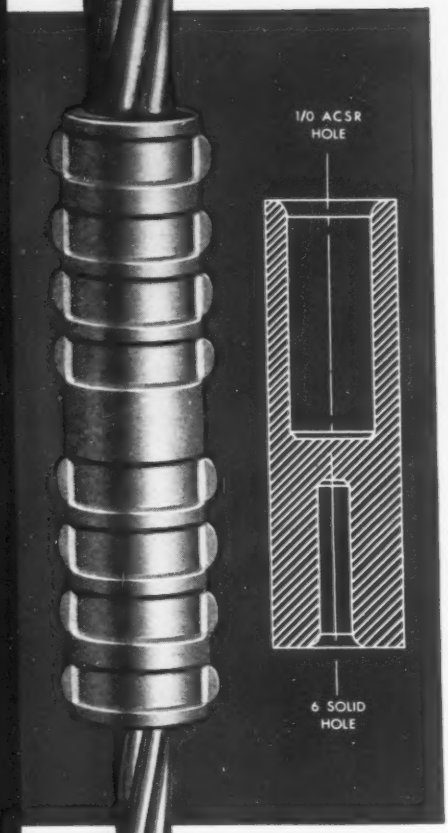
This Allis-Chalmers quality control check is assurance that the transformer insulation can withstand severe lightning and surge conditions. It has resulted in an enviable operating reliability record, especially in areas of heavy lightning concentration.

For the complete craftsmanship story contact your A-C representative, or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-5559

You get HIGHER CONDUCTIVITY with BLACKBURN SERVICE ENTRANCE SLEEVES



because Blackburn... and Blackburn alone... provides GREATER CONTACT AREA where needed

Hole Depth Increases With Size of Conductor... thereby providing more contact area for the conductors being connected.

COLOR CODE	WIRE SIZE ACSR	WIRE SIZE AWG	HOLE DEPTH IN INCHES
Brown	–	8 sol — 10 str	.820
Green	–	6 sol — 8 str	.840
Blue	6	4 sol — 6 str	.860
Orange	4	2 sol — 4 str	.925
Red	2	1 sol — 2 str	1.010
Yellow	1/o	1 o str	1.185

The center stop in a Blackburn Sleeve is a solid barrier that assures proper distribution of the inhibitor around the conductors.

FIRST! Printed (not indented) permanent COLOR CODING *is easier to read*—makes size identification positive and quick.

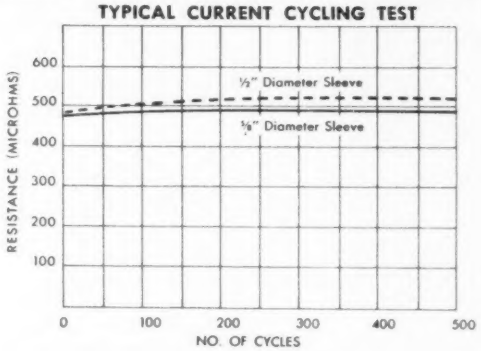
FIRST! Aluminum Sensitized Tape seals the Blackburn Sleeve's ends. Easy to puncture... and, if a particle of the seal is pushed into the chamber, it is conductive.

FIRST! Each Blackburn Sleeve contains the superior Blackburn inhibitor, Contax, *in measured amount.* Won't squirt out on glove or in face.

LIVE BETTER ELECTRICALLY

Conductivity of Connection PROVED GREATER Than Equivalent Length of The Conductors Being Connected.

TYPICAL CURRENT CYCLING TEST



A series of typical current cycling tests were conducted with both ½" x ⅜" diameter BLACKBURN Sleeves. Note the lower resistance of Blackburn Sleeves as compared to the equivalent length of cable without any sleeve.

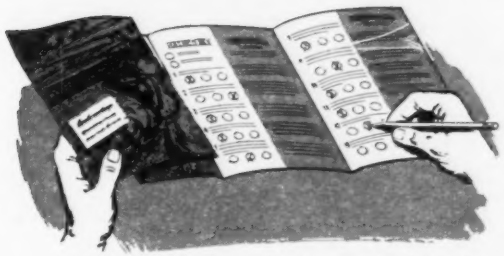
Test Conditions

Wire: 2 ACSR to 4 stranded copper
Current: 190 Amperes
Cycle: 2 Hrs. "On" 1 Hr. "Off"
Length of Connection: 24 inches
Curves represent an average of five tests
Resistance of equivalent length of wire: 527 Microhms

JASPER BLACKBURN CORPORATION, 1525 Woodson Rd., St. Louis 14, Mo. • WYdown 3-9430

Stop explosions before they blow

Send for the CROUSE-HINDS "Hazard Finder"



● The Hazard Finder will enable you to make a quick survey of the hidden probabilities of electrically-ignited explosions in your plant.

Let Crouse-Hinds equipment and technical assistance help you to prevent electrically-ignited explosions.

The more than 13,000 Condulet ® items in the Crouse-Hinds line, include the world's widest selection of explosion-proof and dust-tight electrical equipment. There are Condulet devices for every circuitry requirement, and for every hazardous area and condition. All backed by engineers and technicians thoroughly familiar with Article 500 of the National Electrical Code and its application to specific situations.

For a quick, general survey of probable dangers in your plant, send for the Hazard Finder. For technical discussion of specific areas and hazards, write for Crouse-Hinds bulletins which apply.

• Or for personal assistance, ask any of the offices listed below to send a Field Engineer.

FREE

CROUSE-HINDS CO.
Syracuse 1, N. Y.

I want to check my plant. Send me your Hazard Finder.

Name_____

Company_____ Title_____

Address_____

City_____ State_____

CROUSE HINDS

MAIN OFFICE AND FACTORY: SYRACUSE, NEW YORK
Crouse-Hinds Company of Canada, Ltd., Toronto, Ont.

● CONDULET® ELECTRICAL EQUIPMENT (Explosion-Proof and Conventional) ● FLOODLIGHTING
● TRAFFIC CONTROL SYSTEMS ● AIRPORT LIGHTING and WEATHER MEASURING EQUIPMENT

These products are sold exclusively through electrical distributors. For application engineering help, contact one of the following offices: Baton Rouge Birmingham Boston Buffalo Chicago Cincinnati Cleveland Corpus Christi Dallas Denver Detroit Houston Indianapolis Kansas City Los Angeles Milwaukee New Orleans New York Philadelphia Pittsburgh Portland, Ore. Salt Lake City St. Louis St. Paul San Francisco Seattle Tulsa Washington **Resident Representatives:** Albany Atlanta Baltimore Charlotte Chattanooga Jacksonville Reading Pa. Richmond, Va. Shreveport

editorial views

On Keeping Informed

WE hear people complain that it takes a lot of reading these days to keep abreast of business developments. It does, unless a certain amount of discrimination and selection of the reading matter is employed.

As a case in point, the staff of Electrical West has been working assiduously to present for Western electrical people a publishing service and format that will be fully informative, fast reading and satisfying businesswise.

By this time you, as a regular subscriber, have received the first midmonth news report. Here is a new summary, highlighting industry activities and pointing up important programs and events.

And take this issue as another example. The statistics on industry growth activities are a welcome and heartening reassurance that business ought to be better than ever. These statistics, by the way, provide benchmarks for business planning, as well as yardsticks for measuring performance. If you haven't already done so, take the few minutes necessary to read through the new News Section and note the thorough, terse coverage of events and activities in the industry.

Five full-time editors travel the equivalent of nearly twice around the world each year to contact Western utility executives. Three regional editorial representatives, together with news bureau representatives, keep their fingers on the local electrical pulse beat in Western cities. All concentrate on collecting, evaluating and appraising possible editorial material.

This month, and every month, the editors' ultimate aim is to provide their audience — in one reading session — a quick-reading and complete summary of interesting and significant items affecting the electrical business of the West. With all due regard for modesty, may they suggest that making Electrical West a cover-to-cover reading habit is the easy way to keep fully informed with a minimum expenditure of business reading time.

Austerity Program

THE President's message to Congress contained much of interest for the electrical industry. If his recommendations were wholly implemented, the spending involved would be a substantial contribution to the economic prosperity of the nation. That impetus, however, would be only temporary if it should result in a substantially unbalanced budget that would add fuel to the fires of inflation.

There was a clear-cut implication in the President's message that all citizens would have to contribute more to meet what he termed the grim future ahead. Such contributions might include more thinking about national problems, more willingness to forego immediate personal advantages, more intelligent action at the polls, as well as more in the way of tax contributions.

Money needed to meet the needs of the national security program must be raised, and it can be raised, by tapping funds which, as the President stated, might have been set aside for projects and services which are not immediately essential to the defense effort or urgent public need. As the Hoover Report so clearly stated, there are literally billions of dollars which could be lopped off the federal government's domestic expenditures through better organization and less waste. There are probably other billions that could be conserved if marginal services now offered by the federal government were eliminated. There could be still other substantial savings made if the government could be made

to step aside and let private capital do the things that it is fully capable of doing and willing to do. Full employment of the partnership principle of power development is one area in the latter category.

Congress should be more preoccupied with international rather than domestic issues during this session. Congress should be more receptive than ever to suggestions from the people as to how to stretch the nation's income to meet the demands of the nation's security. It is a time for all citizens who believe in less government in business to work diligently with their individual congressmen to insure that all federal projects, power or otherwise, are measured against the larger and more important exigencies of the missile age.

Pennywise?

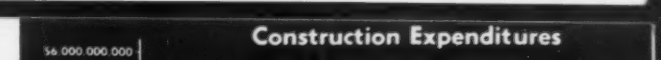
PERHAPS it's the slight downturn in business, or perhaps it's just an extension of the philosophy that volume is synonymous with profits, but there has been considerable talk recently of "soft" market conditions in many lines of electrical apparatus and supplies. There is always some give and take when buyer meets seller but thoughtful men believe that this is no time to exert influences that will depress the price structure of the electrical industry further.

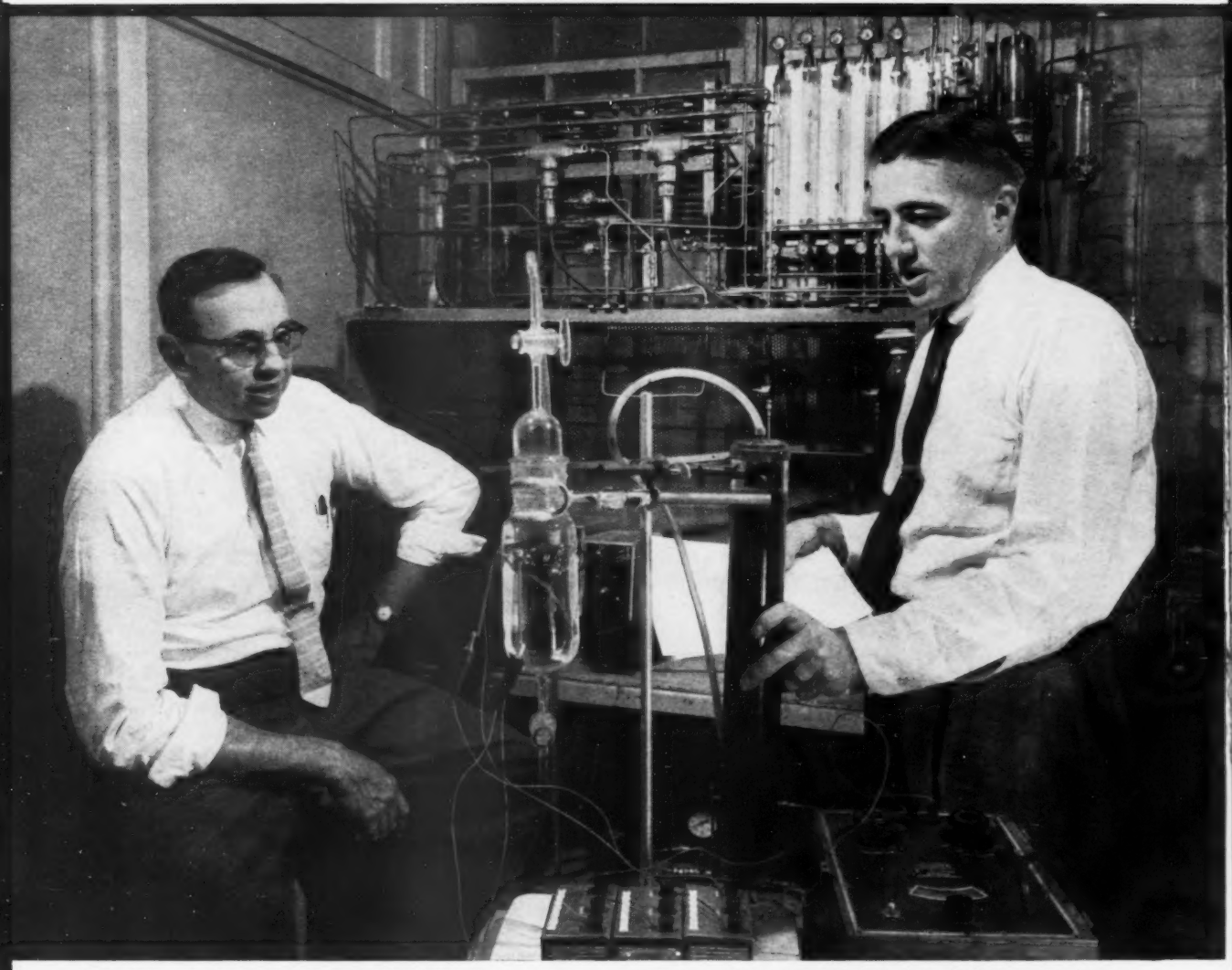
Here's why. The prices of electrical products, as a whole, have not kept pace with the general inflationary price rises that have pushed practically all other lines of durable goods to higher relative levels than those of this industry. Producers, on the other hand, have had to contend with steadily rising costs. The result obviously is a profit squeeze on electrical manufacturers that could, and will, have unpleasant long-range results for the entire industry if the situation is not corrected.

One of the real assets of the industry in the past has been the quality of the products turned out by the electrical manufacturing firms of the nation. Built-in extras have contributed to long life and substantial overload capacities. Research has enabled a continuous flow of new and improved devices to meet the ever-growing needs of the consumers whether they be utilities or housewives. These extras are possible only when manufacturers are enabled to trade in a free market at prices that permit growth, expansion and research. It may be a temporary feather in someone's cap to "break the market" on a particular item but if buyers persist in sharp trading, and manufacturers fail to resist shopping, all of the extras that the industry has enjoyed in the past will soon vanish.

Mark Cresap, Westinghouse Electric Corp.'s new president, made an excellent summary of the situation when he addressed NEMA last fall. He said, "We have, in our industry, experienced over the past five years a disturbing deterioration in the rate of profit return. We have been caught in the vice of a severe cost-price squeeze. We cannot assure the long-term help of our industry unless we receive fair prices for our products — prices which permit reasonable profits — profits which enable us to support our research and development tradition, to generate funds for physical expansion and improvement and to remain attracted to the investment public. . . . A strong and growing electrical equipment industry is important to the national defense, to the electric utility industry, to manufacturing industries generally, to users of electrical products in the home and, finally, to employees."

It is to be hoped that neither the buyers nor the sellers in this great industry of ours will seize the opportunity of a temporary business downturn to gain temporary advantage — an advantage that may well be "pound-foolish" in the future.





INCREASED KVA AND GREATER DEPENDABILITY in large, 3600-rpm generators are possible through water cooling. Observing lab setup for gathering data on water cooling under simulated generator operating conditions are General Electric's C. H. Holley (left), Generator Advance Development Engineer, Large Steam Turbine-Generator Dept., and Dr. G. V. Browning, Physical Chemist, Materials and Processes Lab.

General Electric sees water a promising coolant for tomorrow's large generators

In recent years manufacturers of large, 3600-rpm generators have successfully applied two conductor-cooling methods—liquid and gas—to cool the stators of generators for electric utilities. But as growing load demands units of higher and higher capability, the question arises—which method offers most promise for cooling the larger machines of the future?

LIQUID VERSUS GAS

General Electric, the only U.S. manufacturer experienced with both liquid and gas conductor cooling of generator stators, has found that liquid cooling is far superior. Its superiority will prove even more significant as generator ratings increase. Compared to gas-cooling, liquid systems permit higher kva per unit size, simpler construction and maintenance, and better overall dependability.

WATER MOST PROMISING

Laboratory tests of possible cooling liquids at General Electric Company's Large Steam Turbine-Generator Department indicate that several advantages of water make it potentially the best coolant for generator stators. For example, water has several times the ability of oil to conduct heat away from generator stator bars.

ANTICIPATES UTILITY NEED

General Electric's research and manufacturing leadership in improving generator cooling systems is the result of a continuing effort to meet utility needs with the most effective equipment. For more information on liquid cooling of large generators, contact your General Electric Apparatus Sales Office. General Electric Company, Section 301-366, Schenectady 5, New York.

LIVE BETTER ELECTRICALLY

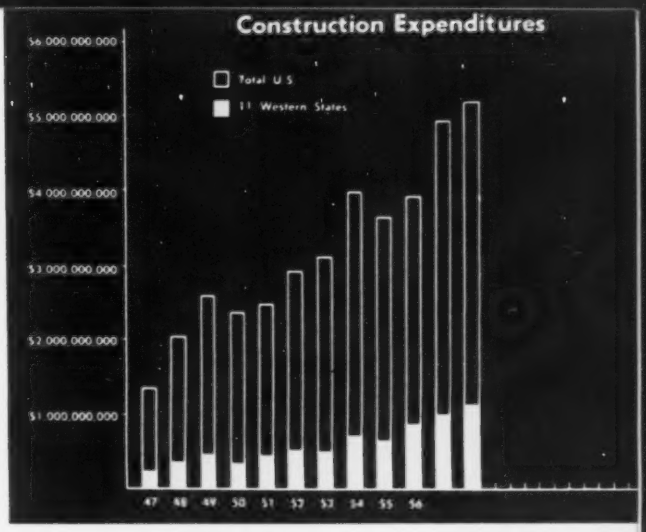
MORE POWER TO AMERICA

GENERAL ELECTRIC

ELECTRICAL WEST

VOL. 120, NO. 2
FEBRUARY 1958

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.



Despite January's temporary lull, statistics for 1958 make reassuring reading—indicate that out West . . .

The Bloom's Not Off the Boom

Although 1958 got off to a slow start constructionwise, the underlying foundation of the Western economy is stronger and broader than ever before. In the first place, the backlog of proposed engineering construction in the 11 Western states is up 4% over a year ago to $27.3 billion. This figure is 24.6% of the U. S. total. Western electric utility budgets (see below) are up 14% over a year ago to a record $1.128 billion.

On the drafting boards of Western architects and engineers are more big multi-million-dollar projects of all kinds than any time in history. There is a resurgence of office and hotel building in practically every major metropolitan area from Denver west. School and institutional buildings, pacing the continued population growth, are on the rise. More multidwelling units, both public and private, will be built than for many years past and private housing starts will total approximately 260,000 for the year. All this adds up to a highly satisfactory business year ahead with the prospects of boom-time construction activity later on when the present watchful waiting period runs its course.

The keystone of electrical industry performance is the capital spending of the electric utility industry. After cracking through the billion-dollar ceiling for the first time in 1957, Western power systems are going on to another new record in 1958. This year they will spend $1,128,000,000. Add $100,000,000 in construction expenditures in western Canada, if you like, and you have a measure of the vitality of the electrical industry of the West. In terms of the 11 Western states, Hawaii and Alaska, this represents a 14% increase over actual expenditures in 1957, which also set a new spending record! For those who are leery of 10-place figures, they have been compiled from an ELECTRICAL WEST survey of the approved budgets of 60 utilities, representing 95.4% of the meters in this area.

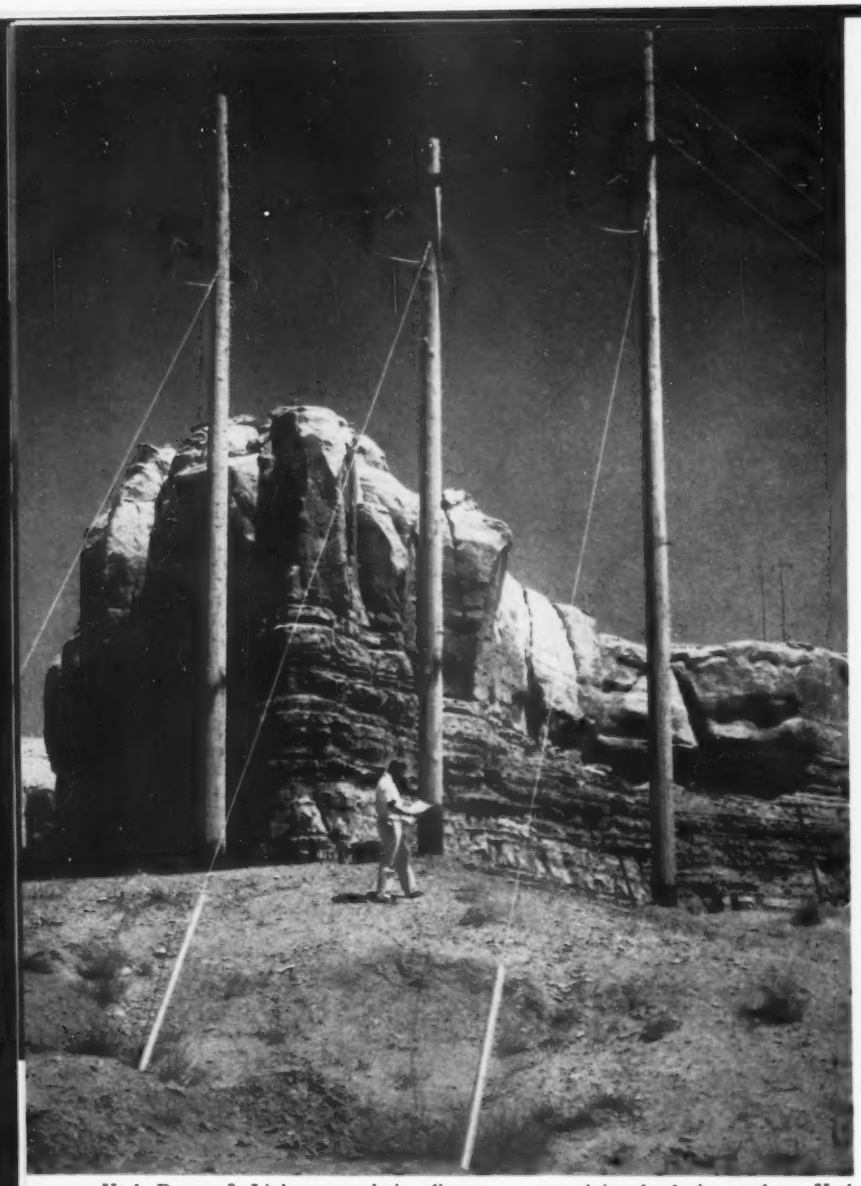
Generation

By any measure, 1958 will be the biggest year ever in terms of new generating capability. It will probably be the biggest year for some years to come. The hydro capability to be added in 1958 is something greater than the total capability—steam and hydro—added during 1957. The 1957 generating additions totaling 3,507,300 kw loom even larger when measured against the total U. S. increase in generation for 1957 of 6,500,000 kw. Here's the

Electric Utility Construction Expenditures
11 Western States Compared to U. S.

Year	U. S.	11 Western States	Per Cent West to U. S.
1949	2,517,614,000	403,000,000	16.1
1954	3,997,669,000	686,133,240	17.4
1955	3,621,513,000	610,736,000	16.8
1956	3,906,000,000	746,000,000	19.1
1957	4,745,961,000	998,000,000	21.0
1958	5,245,820,000	1,128,000,000	21.5

The 11 Western states expenditure figures include Hawaii and Alaska. In previous years we have included figures from British Columbia. B. C. spending this year is $100,000,000—a figure so sizable as to be misleading under the head of 11 Western states. These figures, then, will not jibe with previous years because we have subtracted for western Canada. These figures represent reports from 60 utilities, representing 95.4% of the meters in the 11 Western states, Alaska and Hawaii.—Editor.



Utah Power & Light transmission lines to serve mining loads in southern Utah

breakdown of 1958 generator additions.

Hydro capability	2,249,550
Steam capability	1,257,750
Total	3,507,300 kw

Without question, 1958 will be the feast year. Is famine ahead? Today's plans for additional generation in 1959, 1960 and 1961, as detailed in our Calendar of Generation, page 71, indicate additions of 6,900,000 kw of additional capacity will be added during this three-year period. An average of 2,300,000 kw of new generation for the next three years, when measured by any year prior to 1958, is an excellent year. Capital spending plans for the whole U. S. electrical industry are up more than 10%, but many feel that 1959 will see a 5 to 10% drop over the 1958 peak.

Transmission

Here are the figures comparing what actually happened in 1957 with plans for 1958:

	Completed 1957	Proposed 1958
Line miles	2,600	2,445
Sub kva	5,380,000	6,675,480

The comparisons indicate transmission substation capacity up 25% with line miles down. This is an expression of what we know to be true. The year 1957 has seen the completion of many major transmission links, and 1958 will see the installation of generation and associated step-up substation capacity.

From the point of view of builders of major equipment components, 1958 will be one of good business for equipment to be supplied in future years, but one in which they will receive more dollars in payment for equipment purchased two or three years ago than they will book in new business. This shrinking backlog is an adjustment, in some cases, to white-sale purchasing but certainly not a business slump.

Distribution

Distribution line miles and substation capacity are just the reverse.

	Completed 1957	Proposed 1958
Line miles	6,880	6,922
Sub kva	2,503,000	2,075,000

Line miles are up slightly and distribution sub capacity down 20%. Perhaps the shrinking distribution sub kva is a reaction to the 41% increase experienced in 1957.

Most planners agree that distribution growth will be relatively free of the vacillations that can be seen in generation. Distribution responds more to population growth as well as the increase in the use of residential and commercial power. These trends are well defined and are still on the increase.

Another measure of the stability of distribution activity is the surprising increase in peak demand in a year when kwh sales are down.

Many reports indicate that a lead in generation will give utilities the needed opportunity to study and rework the distribution plant. Certainly there will be a flurry of pole climbing before 58's crop of generation is distributed.

Contractors

Contracting and engineering firms are experiencing a fever of activity in the field, but shrinking backlogs and much less pressure on new design work. Here again, an adjustment or reaction to the 1958 peak.

Utility Outlook

Utility planners, in general, are looking ahead with confidence. In some circles there is a wait-and-see attitude based on the break in this year's kwh sales—this year's increase running at about 7% for the first time in a decade of 10% increases. Two other small clouds on the horizon are a slight decrease in the rate of customer growth and the general business jitters. The majority opinion, however, as evidenced by proposed generation plans, reflects the desirability of the West and the desirability of using electricity. These are basic forces that will be modified only slightly. In short, the curves are headed up asymptotically.

Calendar of New Generation

1958—Fuel Generation Planned

Agency	Plant	Size—Kw
B. C. Electric	Port Mann 1, 2, 3, 4†	100,000
Calif. Elec. Power	San Bernardino	60,000
Hilo Electric	Waiakea No. 4	7,500
L. A. Dept. of W&P	Scattergood No. 1	156,250
PG and E	Hunter's Point No. 4	165,000
PG and E	Humboldt Bay No. 2	50,000
Pacific P&L	Dave Johnston	100,000
PS of New Mexico	Reeves Station	44,000
San Diego G&E	Encina No. 3	100,000
So. Calif. Edison	Huntington Beach Nos. 1 & 2	400,000
Tucson GEL&P	Tucson No. 4	75,000
	Total	**1,257,750**

1958—Hydro Generation Planned

Agency	Plant	Size—Kw
Army Eng.—Portland	The Dalles Nos. 3, 4, 5, 6	312,000
Army Eng.—Seattle	Chief Joseph Nos. 1, 2, 3, 4	256,000
Calif. Oregon Power	Big Bend	80,000
Cowlitz County PUD	Swift No. 2	70,000
Idaho Power	Brownlee	360,400
Idaho Power	Oxbow	151,000
Montana Power	Cochrane Nos. 1 & 2	60,000
PG and E	Poe Nos. 1 & 2	106,000
PG and E	Butt Valley	36,000
PG and E	Caribou No. 2, Units 1 & 2	109,000
PG and E	Balch Nos. 2 & 3	91,500
PG and E	Haas Nos. 1 & 2	128,000
Pacific P&L	Merwin No. 3	45,000
Pacific P&L	Swift	204,000
Portland GE	Pelton	72,000
Portland GE	North Fork	48,000
Portland GE	Faraday Addition	24,000
Seattle City Light	Diablo	25,000
USBR, Idaho	Palisades No. 4	28,500
USBR, Utah	Deer Creek No. 1	2,500
USBR, Utah	Gateway Nos. 1 & 2	4,000
USBR, Utah	Wanship	1,400
USBR, Washington	Roza	11,250
USBR, Wyoming	Glendo Nos. 1 & 2	24,000
	Total	**2,249,550**
	Total for 1958	**3,507,300**

1959—Fuel Generation Planned

Agency	Plant	Size—Kw
Burbank PS Dept.	Olive Ave. No. 1	44,000
Calif. Elec. Power	Yuma Axis	80,000
Glendale PS Dept.	Glendale	44,000
Hawaiian Electric	Waiau No. 5	50,000
L. A. Dept. of W&P	Scattergood No. 2	156,250
PS of Colorado	Cherokee	110,000
So. Calif. Edison	Mandalay Nos. 1 & 2	400,000
So. Colo. Power	Clark No. 2	22,000
Tucson GEL&P	Tucson No. 4	75,000
	Total	**981,250**

1959—Hydro Generation Planned

Agency	Plant	Size—Kw
Army Eng.—Portland	The Dalles Nos. 7, 8, 9, 10	312,000
B. C. Electric	Bridge River No. 2, Units 1, 2, 3	186,000
Eugene W&E Board	Beaver Marsh	30,000
Grant County PUD	Priest Rapids No. 1	395,000
Puget Sound P&L	Upper Baker River	94,000
Washington Water Power	Noxon Rapids Nos. 1 & 2	200,000
USBR, Colorado	Big Thompson	4,500
USBR, Oregon	Green Springs	16,000
	Total	**1,237,500**
	Total for 1959	**2,218,750**

1960—Fuel Generation Planned

Agency	Plant	Size—Kw
Arizona PS	Ocotillo, Units 1 & 2	220,000
Hilo Electric	Waiakea No. 5	15,000
PG and E	Pittsburg No. 5	325,000
PS of Colorado	Cameo	44,000
PS of New Mexico	Reeves Station	44,000
San Diego G&E	South Bay No. 1	130,000
So. Calif. Edison	Huntington Beach No. 3	200,000
So. Nevada Power	Clark No. 3	66,000
	Total	**1,044,000**

1960—Hydro Generation Planned

Agency	Plant	Size—Kw
Army Eng.—Portland	The Dalles Nos. 11, 12, 13, 14	312,000
B. C. Electric	Bridge River No. 2, Unit 4	62,000
Grant County PUD	Priest Rapids No. 2	395,000
Puget Sound P&L	Lower Baker River (Addn.)	64,000
Pacific Northwest Power	Mountain Sheep	282,000
Sacramento MUD	Jaybird No. 1	62,500
Seattle City Light	Gorge	57,000
So. Calif. Edison	Mammoth Pool	126,000
USBR, Wyoming	Fremont Canyon Nos. 1 & 2	48,000
Washington Water Power	Noxon Rapids Nos. 3 & 4	200,000
	Total	**1,608,500**
	Total for 1960	**2,652,500**

1961—Fuel Generation Planned

Agency	Plant	Size—Kw
Arizona PS	(Unnamed)	110,000
B. C. Electric	Ioco Nos. 1 & 2	315,000
Calif. Elec. Power	Cool Water	60,000
Colo. Springs PU Dept.	South Plant	33,000
Hawaiian Electric	Waiau No. 6	50,000
L. A. Dept. of W&P	Haynes No. 1	200,000
PG and E	Pittsburg No. 6	325,000
Pasadena L&P Dept.	Glenarm No. 10	60,000
PS of Colorado	Denver Area	150,000
So. Calif. Edison	Huntington Beach No. 4	200,000
	Total	**1,503,000**

1961—Hydro Generation Planned

Agency	Plant	Size—Kw
Army Eng.—Walla Walla	Ice Harbor Nos. 1, 2, 3	270,000
Chelan PUD	Rocky Reach 1 & 2	203,000
Sacramento MUD	Union Valley	22,500
Pacific Northwest Power	Pleasant Valley	720,000
Tacoma City Light	Mayfield Nos. 1 & 2	80,000
USBR, Colorado	Upper Molina	8,400
USBR, Colorado	Lower Molina	4,600
	Total	**1,308,500**
	Total for 1961	**2,811,500**

1962—Fuel Generation Planned

Agency	Plant	Size—Kw
Arizona PS	(Unnamed)	80,000
Burbank PS Dept.	Olive Ave. No. 2	44,000
L. A. Dept. of W&P	Haynes No. 2	200,000
PS of New Mexico	Reeves Station	75,000
	Total	**399,000**

1962—Hydro Generation Planned

Agency	Plant	Size—Kw
Army Eng.—Portland	Hills Creek	30,000
Army Eng.—Portland	Cougar	25,000
Sacramento MUD	Camino No. 1	45,000
Tacoma City Light	Mayfield Nos. 3 & 4	80,000
Chelan PUD	Rocky Reach 3, 4, 5, 6, 7	507,500
USBR, Utah	Flaming Gorge Nos. 1 & 2	70,000
	Total	**757,500**
	Total for 1962	**1,406,500**

1963—Fuel Generation Planned

Agency	Plant	Size—Kw
Arizona PS	(Unnamed)	115,000
B. C. Electric	Ioco Nos. 3 & 4	315,000
Hilo Electric	Waiakea No. 6	15,000
PS of Colorado	Denver Area	150,000
Utah P&L	(Unnamed)	150,000
	Total	**745,000**

1963—Hydro Generation Planned

Agency	Plant	Size—Kw
USBR, Arizona	Glen Canyon Nos. 1, 2, 3	337,500
USBR, Montana	Yellowtail Nos. 1 & 2	100,000
	Total	**437,500**
	Total for 1963	**1,182,500**
† Gas Turbine	**Grand Total '58 thru '63**	**13,779,050**

Statistical Report of 1957

Comparison of National to Western Operations for 1956 and 1957

	11 Western States		United States		Per Cent West to U.S.
	1956	1957	1956	1957	1957
Energy generated (thousands of kwh)	113,629,594	**121,354,120**	600,667,750	**632,563,416**	19.2
Energy generated hydro (thousands of kwh)	76,594,626	**76,587,688**	122,028,608	**128,595,883**	58.8
Energy generated fuel (thousands of kwh)	37,034,968	**44,766,432**	478,639,142	**503,967,533**	8.9
Per cent hydro to total	67.4%	**62.7%**	20.2%	**20.3%**	
Total installed capacity (kw)	22,249,693	**23,862,794**	120,250,000	**126,807,126**	18.8
Hydro capacity (kw)	13,141,794	**13,800,202**	26,019,000	**26,907,677**	51.4
Fuel capacity (kw)	9,107,899	**10,062,592**	94,231,000	**99,899,449**	10.0
Number of customers	8,230,504	**8,499,720**	52,559,000	**53,995,000**	

Generation Record for Western Public Utilities

(in thousands of kwh)

	1948	1953	1956	1957	% West. States
Arizona	3,282,118	5,438,401	6,035,492	**6,400,542**	5.3
California	20,286,893	35,062,488	46,575,891	**50,454,008**	41.5
Colorado	1,592,067	2,731,390	4,012,588	**4,254,990**	3.5
Idaho	1,622,107	3,850,099	4,520,142	**4,693,545**	3.9
Montana	2,869,825	3,727,297	5,494,898	**5,152,489**	4.2
Nevada	3,607,239	2,127,373	1,669,884	**2,013,326**	1.7
New Mexico	845,696	1,545,681	2,060,455	**2,273,078**	1.9
Oregon	5,433,228	6,891,347	13,461,880	**14,148,938**	11.7
Utah	600,208	1,571,054	2,499,620	**2,693,224**	2.2
Washington	13,881,239	22,933,252	26,223,274	**28,310,842**	23.3
Wyoming	388,656	835,737	947,600	**959,138**	0.8
Total	54,409,276	86,714,119	113,501,734	**121,354,120**	100.0

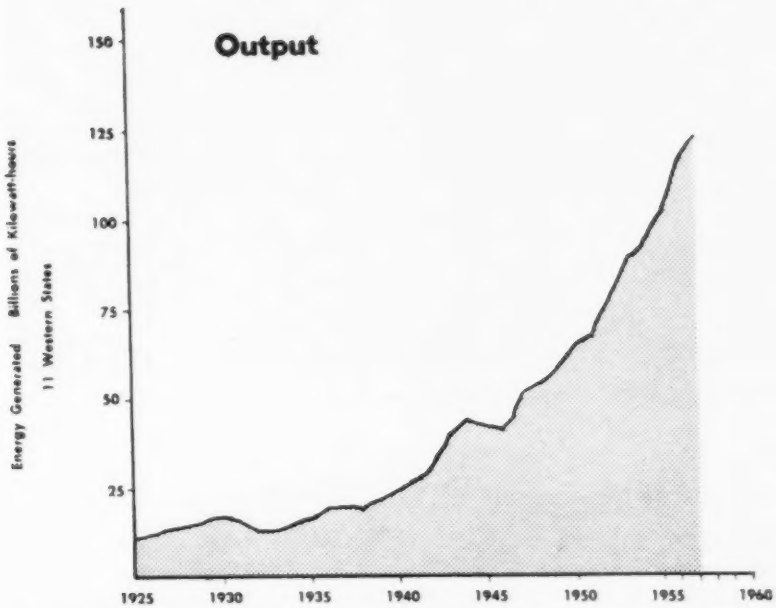
Type and Capacity of Generators

—Generator Capacity in Kilowatts of Plants Operated by—

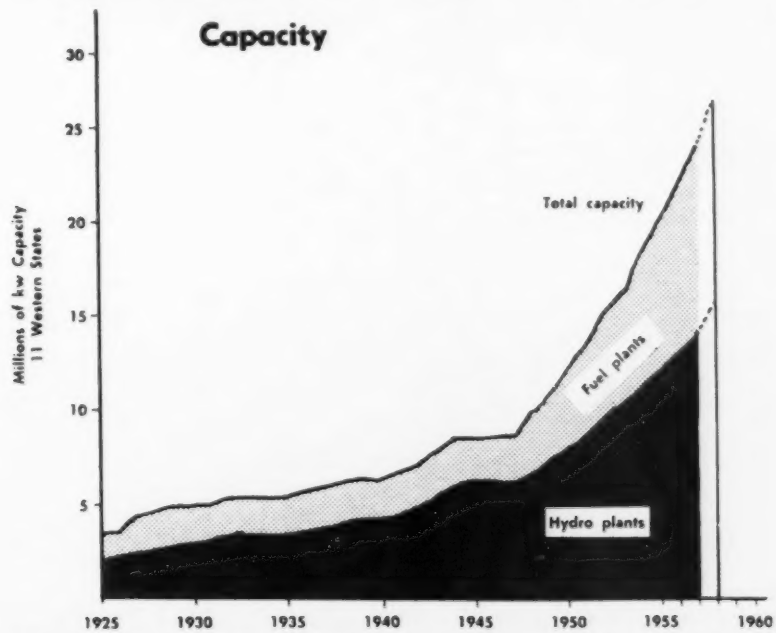
	Number of Utilities	Total Capacity Kilowatts	% Western Capability	Water Power No.	Water Power Capacity	Steam Power No.	Steam Power Capacity	Internal Combustion Engines No.	Internal Combustion Engines Capacity
Arizona	12	**1,732,337**	7.3	12	980,040	12	686,950	17	65,347
California	19	**9,874,219**	41.4	130	3,201,147	31	6,627,736	6	45,336
Colorado	36	**1,073,730**	4.5	28	247,517	24	784,318	26	41,895
Idaho	12	**867,195**	3.6	43	862,880	0	0	5	4,315
Montana	8	**925,152**	3.9	18	850,910	4	71,800	3	2,442
Nevada	8	**702,652**	2.9	10	586,980	1	104,000	6	11,672
New Mexico	15	**577,212**	2.4	3	24,830	13	508,400	16	43,982
Oregon	13	**2,357,894**	9.9	51	2,153,607	12	198,710	6	5,577
Utah	25	**611,921**	2.6	54	87,455	9	488,409	17	36,057
Washington	19	**4,903,954**	20.5	40	4,661,454	8	239,000	5	3,500
Wyoming	18	**236,528**	1.0	19	143,382	12	79,320	20	13,826
11 Western States	185	**23,862,794**	100.0	408	13,800,202	126	9,788,643	127	273,949
United States	1,360	**126,807,126**		1,362	26,907,677	1,045	97,388,665	1,125	2,510,784

* Compiled by **ELECTRICAL WEST** from FPC, EEI and **Electrical World** statistics based on figures through September 1957. Total budget, all agencies, based on reports representing 95.4% of total meters served in the 11 Western States, Alaska and Hawaii.

The West's Growth At a Glance



Energy production in the eleven Western states increased 7% in 1957, a healthy increase but down from the 10% increases common for the past decade



Western capacity addition—3.5 million kw in 1958 will be the largest year in 75 years of prodigious growth. This figure is equal to more than half the capacity additions in the whole United States during last year

✓ **What happened in 1957**
Capacity up 7.2%
Production up 7.0%

✓ **Planned for 1958**
Capacity up 14.7%
Expenditures up 14.0%

✓ **Expenditures over a billion for second year: $1,128,000,000 prospect indicates a smaller 1959.**

✓ **Biggest year ever for new generation! More new hydro in 1958 than total for 1957—2,250,000 kw hydro—1,250,000 kw fuel —a 3,500,000 kw total.**

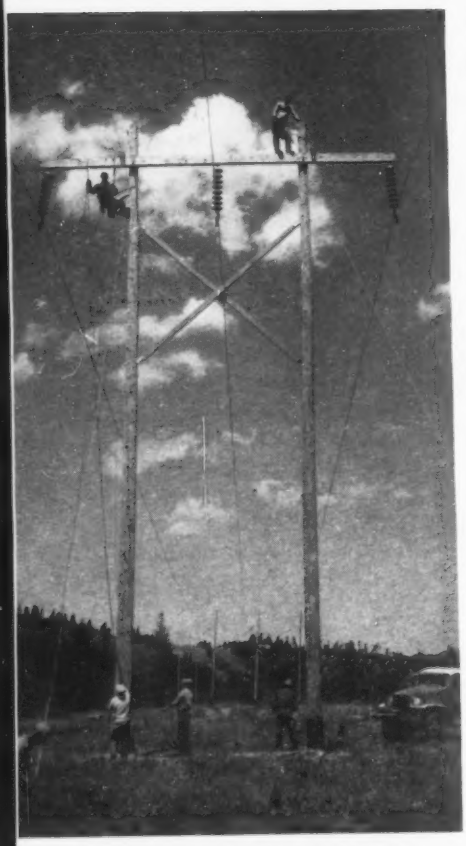
✓ **Projected capacity additions through 1963 slightly under the six-year total of last year.**

✓ **Western capacity and production figures—expenditures all growing relative to total U. S. This year 21.5% of the construction expenditure is in the eleven Western states.**

✓ **Kwh increase of 7% is the lowest in a decade, reflecting a poor water year in the Northwest and fall off in industrial tempo.**

✓ **270,000 New Customers added in 1957.**

Puget Power's Upper Baker River Dam begins to take shape, promising 90,000 kw of new capacity for the Northwest in 1959



Montana Power crews building the second 57-mile 161-kv line from Kerr hydro-electric plant to Missoula

How will they spend $1,128,000,000?

Read . . .

Utility Executives

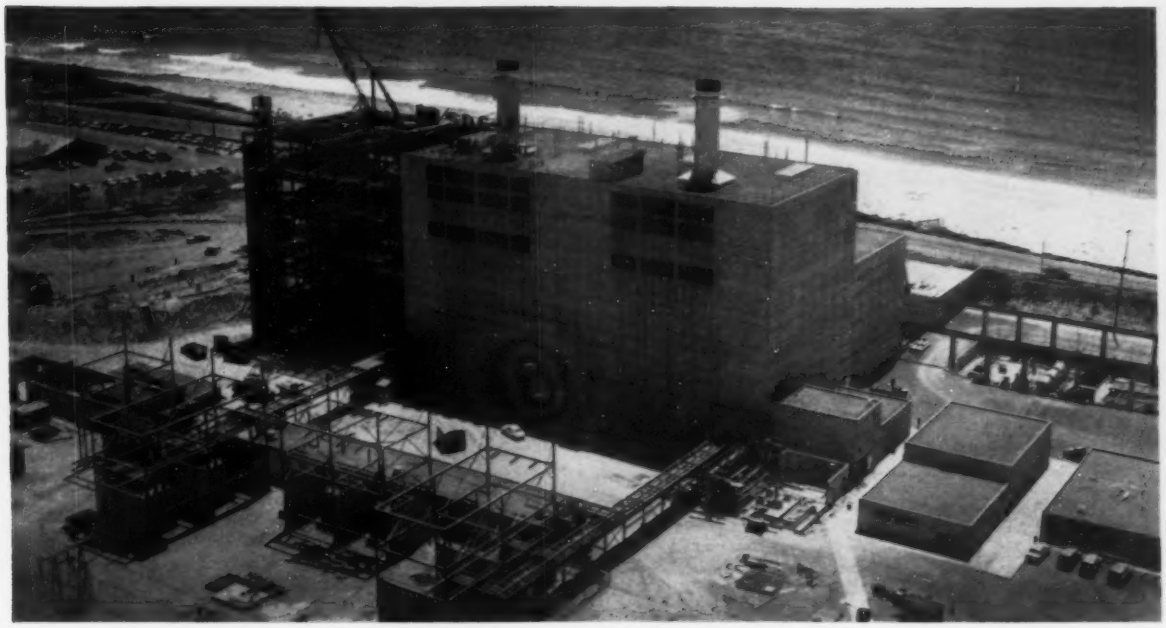
Arizona

Arizona Public Service

Construction Expenditures
Up $10,500,000

Construction expenditures for electric facilities to be added during 1958 are estimated to cost $27,000,000, as compared with $16,500,000 spent during 1957. There were no major generating units added in 1957. However, engineering and site preparation was in progress on the two 110,000-kw steam units to be installed at the Ocotillo power plant, located east of Tempe, Ariz. These two units are scheduled for completion in 1960. Also, joint engineering studies with California Electric Power Co. were completed and initial engineering and construction were started on the Yuma Axis power plant. The initial unit of 80,000 which will be installed by California Electric Power Co. and operated by Arizona Public Service Co. is scheduled for completion in 1959.

Transmission line mileage to be added during 1958 is estimated at approximately 294 miles, compared with 60 miles constructed in 1957. The major transmission lines completed in 1957 include the 69-kv Orangewood sub-Camelback sub line, the Vicksburg-Salome 69-kv line, extension of a 69-kv line to the new Union Hills substation, to the new Theba substation, and to the new Aztec substation. Late in 1957, construction was started on three 230-kv transmission lines, 66 miles Prescott to Flagstaff, 37 miles Round Valley to Seligman, and 36 miles Flagstaff to Leupp. These lines are scheduled for completion early in 1958. Besides normal load growth, these lines will also serve the compressor stations of the El Paso Nat-



San Diego Gas & Electric adds a third unit to its seaside Encino power plant. Another 106 mw scheduled for 1958

Report on Western Construction

ural Gas Co. at Seligman and Leupp. A new 115-kv line will be constructed from San Manuel to Lowell to supply additional power to the Bisbee-Douglas area, now served primarily by diesel engine generated power.

Distribution lines to be built in 1958 will total approximately 650 miles as compared to 400 miles in 1957. Most of these extensions are expected to be of short length, except in the areas with increased irrigation pumping requirements.

During 1957, the company's load reached a peak of 489 mw, which represents approximately 11.6% increase over 1956. Peak load for 1958 is estimated at 560 mw.—**T. A. Phillips, vice-president in charge of engineering.**

Parker-Davis Project, Arizona-California, USBR

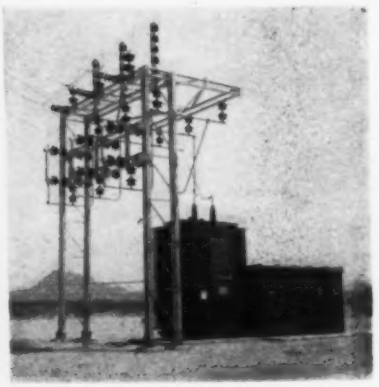
The contract for construction of the Bureau of Reclamation's first microwave radio communication system was about 50% completed at the end of the year. The system is to operate between Parker Dam and Phoenix, Ariz., a distance of 130 miles. It will have two terminal stations and two repeater stations and will provide five channels for voice communication from the bureau's power system dispatcher at Phoenix to Hoover, Davis and Parker power plants, the Gila substation near Yuma, and the dispatcher for the Southern California Edison Co. at Alhambra, Calif. The system will also have a service channel and 19 telemetering channels for dispatching data on power generation.

Salt River Power District

'57 Peak Up 32%

The first unit at Agua Fria steam-electric station was placed in commercial operation on April 1, 1957. Trial operations on the second unit

Hot-line work on one of the West's rural electric distribution systems



Scroll (left) will power the 12,000-kw Glendo plant. (Above) Salt River powers desert sub—prelude to a community

were started on Nov. 15, 1957, with commercial operation commencing on Jan. 1, 1958. Each of these tandem compound, double flow units has a rating of 113,636 kw at 30 lb Hydrogen and 85% power factor. The completion of this station several months ahead of schedule resulted in material savings, and will permit its use during the heavy springtime irrigation pumping period.

The new main office building, located near the geographic center of the Salt River Project, was completed and occupied during the spring of 1957. The two-story, air conditioned building contains 75,000 sq ft of floor space for about 400 employees. The power operations office, located near the main office and the Cross Cut generating station, was completed near the end of the year. This building provides consolidated offices for power operating and dispatching personnel.

The 1957 total peak was 346,200 kw, exceeding the previous year's peak by some 32%. The 1,800,000,000 kwh generated and purchased in 1957 was 24% greater than the 1957 energy requirements. The number of customers served passed the 58,000 mark.

Five new 69/12-kv substations, a 115/6.9-kv substation, a 69/4.16-kv substation, and a 12/4.16-kv substation, with a total transformer capacity of 71,000 kva were placed in service during 1957.

Construction expenditures for new and improved plant facilities in 1957 were $16,600,000, as compared with $17,100,000 in 1956. Approximately $5,900,000 are budgeted for 1958, with no new generating units scheduled.

Construction for 1958 will include two new 69/12-kv substations, a 115/23-kv substation, and enlargement of two existing 69/12-kv substations. Total transformer capacity involved will be of the order of 60,000 kva. Construction of 20 miles of 115-kv line and nine miles of 69-kv line are scheduled for 1958.—**T. M. Morong, chief engineer.**

California

Burbank PS Dept.

New Generation During '58

During 1958 we will be constructing a 20,000-kva distributing station and a 44,000-kw steam-electric turbine generating plant as an addition to existing generation, two short 69-kv transmission lines and a 69-kv to 34-kv, 57,000-kva receiving station in connection with the power plant addition. The distributing station will be completed in 1958 and the power plant, lines and receiving station in 1959.—**Alan E. Capon, principal utilities engineer.**

California Electric Power

San Bernardino No. 2 to Be Completed in '58

Major construction work carried out or in progress during 1957 included several large projects: (1) completion of the first 60,000-kw generating unit at the San Bernardino steam plant together with terminal facilities and auxiliaries, including construction of an 11.5-mile section of gas supply line; (2) construction progress on the installation of the second 60,000-kw generating unit at the San Bernardino steam plant; (3) starting of active construction work on the installation of the first 80,000-kw generating unit and appurtenances at the Yuma Axis steam plant; (4) construction progress on the new general office and general service center buildings located in the San Bernardino and Rialto areas. The general office and service center are scheduled for occupancy the first quarter in 1958.

Preliminary engineering and design work was also started on the Cool Water steam plant to be located near Daggett, Calif.

Expansion of the transmission system included completion of a 37-mile section of a single-circuit, 115-kv line to serve a large industrial customer; construction of a 51-mile section of single-circuit, 161-kv line to serve an expanding industrial load as well as provide service to a new area.

During 1958 the largest individual construction expenditures will relate to:

1. Additional Generating Capacity

Work at the San Bernardino steam plant will include completion of the second 60,000-kw generating unit scheduled to go into commercial service about June 1958.

At the Yuma Axis steam plant construction work will be geared to a completion schedule in which the target date is early 1959.

At the Cool Water steam plant site work will be continued in connection with exploratory tests and preliminary design. Active construction work related to the project will include the construction of 40 miles of 115-kv, single-circuit transmission line together with associated terminal facilities. The transmission line will provide parallel line facilities between existing substations until such time as the line is used for

handling the output of the plant.

Work at hydroelectric generating plants will include improvements at existing dams, intakes, pipelines and related works; increase the useful storage at an existing storage reservoir; replacement of 4,600 ft of woodstave pipeline; rewind a generator at an existing plant; replace the waterwheel at another plant; replacement of a generator regulator at an existing plant; installation of a venturi meter; miscellaneous improvements to electric auxiliaries and construction of and improvements to miscellaneous plant buildings.

2. Transmission Additions

Other transmission lines to be added include a 28-mile section of single-circuit, 115-kv line to provide parallel service into a rapidly developing area (line to be operated temporarily at 34.5 kv); and a 1.6-mile section of 161-kv, single-circuit line and associated terminal facilities in the United States to serve a Mexican company. In addition to actual construction on the foregoing lines there will be engineering and design work carried on in connection with the early 1959 construction of a 1.6-mile section of 161-kv line to deliver the output of the first unit of the Yuma Axis steam plant; early 1958 completion of a 3.5-mile section of double-circuit, 115-kv line will also provide for delivery of energy from the San Bernardino steam plant. This latter line was under construction in late 1957.—**W. T. Johnson, vice-president and executive engineer.**

California-Pacific Utilities

Peak Demand Increased 10.2%

A major portion of our 1957 budget was expended in the addition of new distribution system capacity on practically all of the company's electric service areas. This included a substantial amount of new distribution substation transformer capacity. More than 70 miles of new distribution were also added in the various rural communities served by our company.

Expansion of customer industrial facilities took a good share of construction budget expenditures for new distribution line and substation capacity. This included the new facilities required to serve a two-million-dollar chemical lime plant, the first of its kind in Oregon. This plant, which went into production a few months ago, is located at Baker. The rate of increase in the use of electric energy on our eastern Oregon properties was reduced somewhat because of the curtailment in housing construction which, of course, caused some reduction in operations at the lumber mills. Even so, load growth of all types during the year increased the company's system peak demand by 10.2%.

The company's 1958 construction budget of approximately $2,000,000 projects the expenditure of nearly half of this amount for new facilities on our electric properties. With an increase of over 6% in the average use of electricity by domestic customers to approximately 6,100 kwh annually, naturally our 1958 budget includes substantial amounts for new distribution system capacity. This budget is divided approximately as follows:

Transformers, meters & services	33%
New extensions for the addition of prospective new business	16%
Distribution system substation additions	18%
Urban and rural distribution rebuilds	19%
Miscellaneous, including tools and transportation equipment	14%

Included in the amount projected for substation expenditures is a substantial amount for new capacity on our southern California properties at Needles. Improved voltage regulation of the transmission line through southern Nevada, to Needles, will also result from the new construction projected for this portion of the company's service area.

Several new high intensity street lighting systems were built or added to recently constructed systems in commercial areas of various communities. Our 1958 budget therefore also provides for considerable expansion in new street lighting facilities.

We can see no reason why our company will not experience the same healthy growth of our electric business as we have had during the past few years.—**E. K. Albert, president.**

Federal Reports

Army Engineers

The many large multipurpose power projects now under construction in the Pacific Northwest by the U. S. Army Engineers will be found listed under the states in which they are located.

Bonneville

Report of the Bonneville Power Administration on page 86.

REA

Tabulations showing status of REA borrowers are on pages 93-94. Construction plans are on page 93.

Bureau of Reclamation

Reports on Western USBR projects will be found listed under the states in which they are located.

PG and E's Balch diversion dam on the Kings River. Kings River additions will add 220 mw in 1958

Glendale PS Dept.

10% Increase in Capital Expenditures

The past year, 1957, saw the start of construction of No. 4 unit addition to the city's existing steam power plant, completion of which is expected in 1959. Complete engineering design of the addition is proceeding. Preliminary engineering has been completed for a new 8,000/9,200-kva distribution substation to be completed late in 1958.

Normal system growth accounted for the addition of 6,518 kva of distribution transformer capacity and the connection of 1,034 new meters. This also accounted for the 261,982,000 kwh consumption, representing a 4.9% increase, and the 60.6-kw peak demand represented a 5% increase over the previous year.

The current 1957-58 fiscal year's budget for capital expenditures is $958,618, which is approximately 10% above actual expenditures last year.

The normal budget program of replacing older pole lines which have passed their economic life is continuing as in the past, as is new construction to serve additional customer load. Two existing overloaded 4-kv feeder circuits will be split into two circuits each, making use of substation feeds already installed.

The city's eight-year street lighting improvement program was carried through its fourth year. Progress was marked by the replacement of 138 bare lamps in old style radial wave reflectors with 2,500-lumen lamps in refractor-type enclosing globes, and the addition of 193 of these new type units. One hundred forty-seven 20,000-lumen mercury vapor units were installed on major thoroughfares and 67 units installed at major intersections as a part of the State of California's intersection safety lighting program.—**L. W. Grayson, general manager and chief engineer.**

Los Angeles Dept. of W&P

'58 Construction Budget Up $8,000,000

The department continued its construction program at a high rate to provide the necessary plant and facilities to keep pace with the growing requirements for electrical energy in the city of Los Angeles. Expenditures for construction of new plant facilities and additions and betterments to existing plant were approximately $39,300,000 in 1957, and the expenditure program of $57,377,000 for 1958 provides for a continued high level of construction of new facilities and expansion of existing facilities.

Construction of the first two units of Scattergood steam plant, located on the ocean front adjacent to the Los Angeles-El Segundo city boundary, was initiated in 1957. These units, each rated at 156,250 kw, are scheduled for operation in the fall of 1958 and fall of 1959, respectively. Ultimate capacity of this plant consisting of six units will be not less than 1,200,000 kw. Construction of 12.4 miles of 138-kv transmission lines consisting of 4.8 line miles of towers and 7.6 miles of underground was initiated the latter part of 1957. These lines will be energized as the units at Scattergood steam plant are placed in service.

A 3,200-kw hydroelectric plant located below the Pleasant Valley re-regulating reservoir and 10 miles north of Bishop was energized in December 1957.

Engineering is in progress for Haynes steam plant located just east of the San Gabriel River and north of the city of Seal Beach. Planned ultimate capacity is 1,400,000 kw, and initial installation will be two 200,000-kw units. Specifications are in progress for the boilers and turbine generators. Construction is scheduled to begin in summer 1959.

The department's first underground distributing station was placed in service in 1957 at a total cost, including electrical equipment, of about $1,300,000. Two other stations of the wall enclosed, outdoor type were completed. These stations, together with changes at existing stations, increased the distributing station capacity by 106,500 kva. Distribution lines added in 1957 included 25 circuit miles of 34.5-kv overhead and 7.44 circuit miles of 34.5-kv underground, 164 miles of 4.8-kv overhead primary and 26.55 circuit miles of 4.8-kv underground primary. The 1957 system peak was 1,346,000 kw on Dec. 12.

Construction of receiving station N is scheduled to start and be completed in 1958. This station, located in the vicinity of the Los Angeles International Airport, will take care of the rapidly increasing industrial load in that area. Initial installation will consist of two transformer banks totaling 120,000 kva.

Three new distributing stations, which are scheduled to be placed in service in 1958, together with additions at existing distributing stations, will increase the distributing station capacity by 152,000 kva. New distribution lines to be built will include 25 circuit miles of 34.5-kv overhead and 7 circuit miles of 34.5-kv underground, 164 miles of 4.8-kv overhead primary and 30 circuit miles of 4.8-kv underground primary. The system peak for 1958, according to present estimates, should be approximately 1,460,000 kw.

An extensive program to enlarge and improve the department's various overhead and underground district headquarters, and general service headquarters was carried on during 1957.—**Ivan L. Bateman, chief electrical engineer and assistant manager.**

Modesto Irrigation District

Completes 70 Years of Service

During the year 1957 approximately $1,000,000 were expended for increased distribution and transmission facilities. The major portion of this expenditure was for distribution substation capacity. 25,000 kva of transformer capacity was added in this manner, one new station of 5,000 kva, two stations increased from 5,000 to 10,000 kva, and one station increased from 10,000 to 20,000 kva.

One new 69/12-kv substation of 5,000 kva initial capacity is now under construction and will be completed in 1958.

Construction of new distribution lines continued at a normal rate, namely about 11 miles, with about 18 miles of 4 kv converted to 12 kv. It is anticipated these figures will rise in 1958 to about 19 miles of new distribution lines and 22 miles of 4 kv to 12 kv conversion.

About 4½ miles of 69-kv transmission line was constructed in 1957. While no actual transmission line construction is planned for 1958, rights-of-way will be obtained for approximately 5 miles of line.

This year marks the 70th anniversary of the founding of the Modesto Irrigation District.—**C. E. Plummer, chief engineer.**

Pacific Gas and Electric

685 Mw Capacity to Be Added During '58

The 1957 peak load of 4,080,000 kw occurred in August, an increase of approximately 1.4% over the 1956 peak. This increase is lower than usual due to the fact that part of the energy wheeled to customers of the Central Valley Project in 1956 was supplied directly from CVP lines

in 1957. Without this transfer, the normal increase in peak load would have been 5.3%.

Gross capital expenditures for electric plant during the past year amounted to $143,000,000, an increase of about 52% over the 1956 outlay of $94,000,000. For 1958 it is estimated that the electric department figure will be about the same as the amount spent in 1957, although expenditures for gas and other plant are expected to be considerably less than in 1957.

Although during 1957 only a relatively small generating station of 5,000 kw capacity was added to the system, these were significant kilowatts. For, in October, electricity generated by nuclear energy first flowed into the company's network.

The Tri-Dam Project of the Oakdale and South San Joaquin Irrigation Districts was placed in partial operation in 1957. The project is now in full operation and its output is being delivered to PG and E lines. In addition, during the current year, 685.5 mw of PG and E generating capacity are scheduled to be placed in operation. Of the total, hydroelectric plants will account for 470.5 mw. On the Feather River: the two-unit, 106-mw Poe Plant; the single-unit, 36-mw Butt Valley plant; and the two-unit, 109-mw Caribou No. 2 plant, to be located near the site of the existing No. 1 installation. And on the Kings River: the 91.5-mw, two-unit addition to the existing Balch plant, and the 128-mw, two-unit Haas plant. The Haas installation will be unique in that the waterwheels and generators will be located in an underground chamber 500 ft below ground surface, near Balch Diversion Dam, about five miles upstream from the existing Balch power plant. All of this capacity is expected to be placed in operation late in 1958.

Steam-electric plants will account for the remaining 215 mw of 1958 capacity. Unit No. 4 at Hunters Point on San Francisco Bay will be completed this year at an estimated cost of $21,000,000. This 165-mw unit, which is scheduled for operation during the summer, will boost the total station capacity to 427 mw. The 50-mw unit No. 2 at Humboldt Bay, near Eureka, is expected to be operating this autumn, at a cost of $6,700,000. This addition will bring the station capacity up to 100 mw.

Construction of unit No. 5 at Pittsburg power plant, at the confluence of the Sacramento and San Joaquin Rivers, will start in the early part of this year. This 325-mw addition is scheduled for operation in the spring of 1960 at an estimated cost of $42,000,000. Unit No. 6 is anticipated to be operative about one year later. Completion of these two 325-mw units will raise the station capacity to 1,310 mw.

In 1957, 586.4 mva of transmission and distribution transformer capacity were added to the system. This total includes 5.4 mva of step-up capacity at Vallecitos nuclear power plant. During the current year an estimated 1,224 mva will be placed in operation, of which 825 mva will be step-up capacity at seven generating stations.

The company added 155 line miles of transmission (60 kv through 220 kv) and 1,500 line miles of distribution line to its system during 1957. In 1958, about 285 and 1,500 line miles, respectively, are planned for construction. — **Walter Dreyer, vice-president and chief engineer.**

Pasadena L&P Dept.

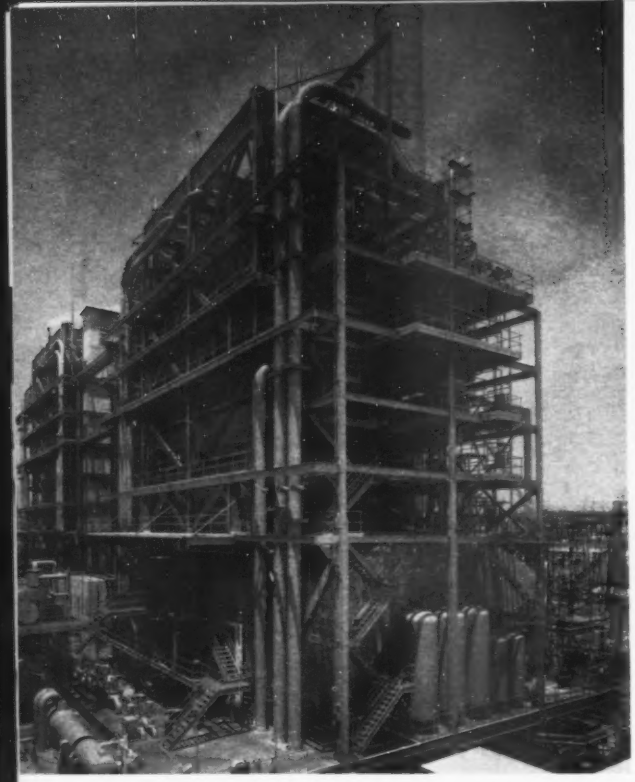
Energy Sales Up 14%

During the fiscal year 1956-57, energy sold in Pasadena exceeded the previous year by 14.2%. Total revenues increased by 10.1%, and operating expense increased by 11.8%. Additions to capital amounted to $2,127,819.25. Construction work in process account as of June 30, 1957, amounted to $5,587,454.79. Distribution transformers in service increased from 120,950 kva to 133,841 kva or 10.7%. Number of meters increased from 47,636 to 48,133 or 1%.

The 40,000-kw Broadway unit No. 2 together with a related expansion of receiving station C was placed in operation during the latter part of the fiscal year.

The first 34,000-v transmission line between receiving station C and the Chester substation was placed in

City of Los Angeles adds transmission lines to keep up with growth in generation



Southern California Edison adds Unit No. 6 at its Redondo Beach station. The new unit is a high-efficiency 175-mw unit, bringing the station total to 638 mw—the largest on the Edison system

operation recently. The second line was completed in October.

The department's program of converting its primary distribution voltage from 2,400 v to 4,160 v continued during the year. — **T. M. Goodrich, general manager and chief engineer.**

Riverside PU Dept.

Kwh Sales Up 16%

A fourth transmission line (33 kv) placed in service prior to the 1957 winter peak highlighted the Riverside Light Department's major expansion program for the year.

The 14% increase in system demand (40,000-kw peak this winter compared to the 35,200 kw of 1956) necessitated an additional 4,600 kva in installed substation capacity. In line with the new system peak, a 5% increase in new meter installations brought the 1957 total to 27,900.

Approximately $850,000 were spent during the calendar year of 1957 on new construction and line rebuilds. An anticipated $900,000 will be budgeted for 1958.

Construction highlights consisted of connecting to the system twelve windmachines totaling over 1,000 hp installed for citrus grove frost protection. The practice of banking conventional transformers using secondary fuses has been continued with satisfactory results in nearly all of the larger subdivisions. Supervisory control was added to two of the older existing substation circuits. **—Don Campbell, utilities engineer.**

Sacramento MUD

'58 *Plant Expenditures More Than Triple* 1957

Substantial increases in number of customers served, energy usage and system peak load were recorded during 1957. 135,500 customers were being served at year end, an increase of 4% over 1956. Energy sales rose to 1,020,000,000 kwh, up 9.2%, while system peak demand reached 228,800 kw, approximately 4.1% greater than 1956.

Plant expenditures for the year amounted to approximately $6,000,000. Included was enlargement of the South City substation, which resulted in a firm station capacity of 100,000 kva to be supplied to the 23-kv subtransmission system from a six-feeder ring bus. Routine additions to the overhead system included 11 unit substations totaling 32,750 kva, 21 miles of 23-kv and 69-kv subtransmission lines and approximately 60 miles of lines converted from 4 kv to 12 kv.

Switched and fixed capacitor banks totaling 30,000 kvar were installed in both the overhead distribution and underground supply systems.

Budgeted for 1958 are $19,700,000 for plant additions. This record budget not only reflects the routine construction to keep pace with the continued growth of the Sacramento area, but also contains several special items.

Actual construction of Stage 1 of the Upper American River Project is scheduled to start in early spring and approximately $8,000,000 have been allocated for progress payments during the year.

The district's Hedge substation presently under construction and scheduled for completion by year end, will serve as a key receiving point for both Upper American River Project power and power to be purchased from the Pacific Gas and Electric Co. Ring bus design is being incorporated in both the 230-kv and 115-kv facilities. One 120,000-kva, three-phase, 230/115-kv transformer and one 160,000-kva, three-phase, 230/69-kv transformer with load tap changing will be installed on this first stage of station development which is estimated to cost $2,500,000.

Approximately $2,000,000 have also been included for progress payments on the construction of a new office building on 14 acres of property in outlying Sacramento. — **Charles R. Day, supervising electrical engineer.**

San Diego G&E

System Peak Up 8.5%

A system peak of 484,500 kw was reached in December 1957, setting a new record for the company and surpassing the 1956 peak of 446,500 kw by 8.5%.

Construction expenditures for electric plant in 1957 total approximately $18,120,000. Construction for the addition of unit No. 3 at Encina power plant was the major project during 1957. About $7,900,000 were spent for this purpose. Groundbreaking ceremonies for the new South Bay power plant were held in October 1957. Clearing of the plant site and excavating for foundations were begun immediately. Cost of this work and other miscellaneous power plant projects amounted to $226,000 in 1957. The third unit at Encina will raise the company's generating capability from 566,000 kw to 672,000 kw when it is completed in August 1958. The first unit at South Bay power plant, scheduled for operation in July 1960, will add another 136,000 kw of capability.

Transmission plant additions totaled $2,146,000, while distribution facilities added in 1957 amounted to $6,929,000. Of this amount, about $2,600,000 were invested in new customer extensions, $1,500,000 in transformer and meter purchases, $1,029,000 in substation additions and $1,800,000 in various improvement of service projects.

The preliminary construction budget for 1958 electric plant additions totals $18,885,000. Of this total, an estimated $7,194,000 are to be spent on electric production projects, $4,598,000 on transmission facilities and $6,659,000 on the distribution system. The balance of $434,000 is the electric department's prorated share of general construction expenditures.

Completion of the third unit at the Encina power plant will require an expenditure of $4,912,000 in 1958. Total cost of the unit will approximate $14,100,000. During 1958, construction will proceed on the first unit of the new South Bay power plant. About $2,000,000 will be spent during the year. This project, upon completion in 1960, will have involved an expenditure of $24,000,000. The South Bay power plant may ultimately consist of eight units, each unit to be installed as the need for electric power in the company's entire service area requires its addition to the system.

Two major transmission projects in the 1958 budget are the construction of the 138-kv Old Town substation and the installation of a 138-kv line running from the Encina power plant to the Old Town substation. These two additions will cost almost $1,900,000.

It is estimated that provision for service to new customers will cost the company approximately $2,400,000. The number of electric customers increased by about 13,200 in 1957 and now total almost 277,000. A further increase of 11,500 customers is expected in 1958.

About 146,000 kva of transmission and distribution transformer capacity were added in 1957, with a further increase of 373,500 kva planned for 1958. Distribution pole line mileage increased by 160 miles in 1957, and an estimated 177 miles will be constructed this year.—**H. A. Noble, vice-president in charge of operations.**

Southern California Edison

Sizable Capacity Additions During '58

Approximately $134,000,000 were expended during the year 1957 for plant additions to generation, substation, transmission line, distribution line and other system betterments. The budgeted amount for the calendar year 1958 is approximately $119,000,000 for like system additions and betterments.

During the past year, 786.7 line miles of distribution circuits were placed in service and 89.8 miles of transmission circuits were constructed. Three new transmission substations were constructed with an aggregate capacity of 510,000 kva, and 15 new distribution substations were placed in service with a capacity of 251,834 kva. Transformer capacity of 391,668 kva was added to existing distribution substations and 305,000 kva were added to existing transmission substations. Approximately 67,000 new meters were connected to the system.

Two new generating units with a net effective operating capacity of 350,000 kw were placed in service during 1957.

Alamitos steam station is an outdoor-type plant located near Alamitos Bay east of Long Beach, Calif. Physical construction of the first unit was started Feb. 9, 1955. Unit No. 1 was placed in commercial operation Sept. 11, 1956, and unit No. 2 on Feb. 19, 1957. Steam for unit No. 2 is produced in a single boiler having a continuous operating capability of 1,254,000 lb of steam per hour.

The layout of the Alamitos site provides space for the installation of two additional large units when the need arises, and the two cooling water facilities are sized to accommodate four units.

Cost for the station with its two units and accessories, but excluding the cost of new transmission lines, was approximately $36,300,000.

Redondo unit No. 6, at the Redondo steam station No. 2, was placed in commercial operation July 15, 1957. The station is a semioutdoor plant with centralized control facilities and now consists of two units, with associated equipment, each with a net effective operating capacity of 175,000 kw.

In addition to the two new steam-electric generating units reported above, an experimental steam turbogenerator of 7,500 kw rated capacity was first synchronized to the Edison system on July 12, 1957, using heat energy from the sodium-cooled, graphite-moderated reactor of the Atomic Energy Commission, which is operated by the Atomics International Division of North American Aviation Inc., located at Santa Susana, Calif.

The three new transmission substations, previously referred to as having been placed in service in 1957, are Del Amo, El Nido, and Walnut, all located in Los Angeles County.

Currently under construction are 800,000 kw of new steam generating capacity consisting of two units at Huntington Beach steam station and two units at Mandalay steam station.

Construction work on Huntington Beach steam station was started in June 1956. It is a new steam station, located on a coastal site of approximately 60 acres situated within the city of Huntington Beach. It will be an outdoor-type plant with centralized control facilities. The initial installation will consist of two cross-compound, axial flow exhaust, turbogenerators, each having a manufacturer's rated capability of 200,000 kw. The plant is designed for two additional units. The two units will be the first cross-compound machines in the West, and required some unique foundation treatment. Unit No. 1 is scheduled for commercial operation in June 1958 and unit No. 2 for December 1958. Cost of the two-unit installation, exclusive of transmission lines but inclusive of cooling water facilities for four units, is presently estimated at $57,800,000.

Construction work on Mandalay steam station was started in June 1957. It is a new station located on a coastal site of approximately 114 acres situated some four miles west of Oxnard and seven miles southeast from Ventura. It will be an outdoor-type plant with centralized control facilities, and initial installation will consist of two units that will essentially duplicate the Huntington Beach units. Unit No. 1 is scheduled for commercial operation in May 1959, and Unit No. 2 in October 1959. Presently estimated cost of the initial installation, exclusive of transmission lines, is $56,530,000.

One new transmission substation is currently under construction, namely, Santa Clara. It is located some 10 miles north and slightly east of the Mandalay steam station site, and near the town of Saticoy. It will receive the output of Mandalay steam station over two 220-kv lines and will be connected with the company's 220-kv system by two 220-kv lines to Saugus substation some 42 miles to the east. The station will be equipped initially with two 220/66-kv transformer banks of 75,000 kva each. Santa Clara will provide an additional source of supply for Ventura and Santa Barbara Counties. Station design provides for a nine-position 220-kv rack with four positions initially equipped, and a 30-position 66-kv rack with 15 positions initially equipped. The scheduled in-service date is April 1958. Estimated cost of the station only is approximately $2,500,000.

In addition to the new Santa Clara transmission substation, six new distribution substations are planned for

construction in 1958. These new transmission and distribution substations, together with additional transformer capacity to be added during 1958 to existing transmission and distribution substations, will require approximately 749,660 kva of new transformer capacity.

Plans are in progress to construct 864.6 line miles of transmission and distribution circuits in 1958 and to connect approximately 65,000 new meters.—**H. A. Lott, manager, planning department.**

Turlock Irrigation District

Transformer capacities were increased at two distribution substations during 1957.

Distribution feeders were upped in some locations and tie lines added.

Minor additions to transmission facilities are planned for 1958, together with expected additions to distribution system—**L. H. Parker, electrical engineer.**

Colorado

Colorado-Big Thompson Project, USBR

Construction of the Big Thompson power plant and switchyard near Loveland, Colo., began in June. With the exception of these facilities, the transmountain diversion project, begun in 1938, has been completed and all features are in operation. The power plant, about 15% completed at the end of 1957, will house one 4,500-kw generating unit driven by a 6,300-hp turbine. The power house is of the outdoor type and will have a reinforced concrete substructure. The power plant is scheduled to be placed in operation in the summer of 1959. The 13.8-kv switchyard at the power plant will interconnect with the project's Flatiron power plant to bring the total hydroelectric capacity of the project to 183,950 kw.

Colorado Central Power

System Peak Increased 21%

Growth in new customers during 1957 showed an increase of 6% over 1956. Kilowatt-hour sales were up 20% and system peak demand increased 21%. The company spent for construction during 1957 nearly $2,400,000 and the forecast for 1958 indicates we will spend approximately $2,000,000 for construction.

During 1957 approximately $1,000,000 were spent for connecting new customers and routine replacements. Approximately $1,200,000 were spent for major system additions. Included in this item were three 115-kv/13.8-kv substations totaling 57,500 kva.

The impact of new defense industries locating in the company's Arapahoe District created a continuing demand for new housing and the extension of the distribution system was required to meet the demand of this growth.

The growth in the company's Jefferson County District followed very closely the 1956 pattern. The company started construction late in 1957 of a new operating headquarters building for the customer service and construction departments on a site that had been purchased five years ago for the purpose. This site is near the city of Golden. Additional 13.8-kv feeders are to be installed in 1958 to serve the growing loads in the Jefferson County District's mountain areas around Evergreen and Look-Out Mountain.

There is additional microwave and two-way radio equipment to be installed during 1958 and a closed circuit television channel will also be installed during 1958 for supervisory purpose.—**Lee R. Jones, vice-president in charge of operations.**

Colorado River Storage Project, USBR

In April, construction began on the project's principal features, Glen Canyon Dam and power plant. The dam and power plant are on the Colorado River in north central Arizona, about 12 river miles downstream from the Arizona-Utah state line. The Colorado River storage project, and 12 participating projects included in the Congressional authorization of 1956, will develop the water and land resources in areas of the four upper Colorado River Basin states—Arizona, Colorado, New Mexico, and Utah.

Glen Canyon Dam is to be a concrete arch structure 700 ft high and having a volume of more than 5,000,000 cu yd. The power plant will have eight 112,500-kw generating units, each driven by a 155,500-hp turbine. Total name-plate capacity of the plant will be 900,000 kw, making the installation the third largest power plant of the bureau. It will be surpassed by only Grand Coulee (1,974,000 kw) and Hoover (1,249,800 kw) power plants. When completed, Glen Canyon power plant will produce a substantial amount of the electrical energy needed in the Upper Colorado River Basin.

Colorado Springs PU Dept.

Denver-Colorado Springs Tie To Be Completed in '58

Construction of the 115-kv tie line between Colorado Springs and Denver will be completed early in 1958.

Installation of a switching station northeast of Colorado Springs to tie the Denver line into this city and into the existing 115-kv tie line to Pueblo also will be completed in the next few months.

Public Service of Colorado, Southern Colorado Power and the Colorado Springs Department of Public Utilities will be linked into an intrastate loop, which in turn will link into the Northwest Power Pool.

The 22,000-kw unit in the Birdsall power plant was placed in service early in 1957.

Two new substations were placed in service in 1957 and another is nearing completion.

East and west side 34.5-kv lines looping the U. S. Air Force Academy north of Colorado Springs were completed in 1957.—**F. H. Wiley, superintendent, electric division.**

Public Service of Colorado

Electric Construction Up!

The Public Service Co. of Colorado construction expenditures during 1957 were approximately $33,176,600, of which $25,774,700 was for electric facilities. The 1958 total construction program is presently set at $33,545,000 with the electric facilities requiring $27,576,300.

In September 1957, a new 100,000-kw steam-electric unit was placed in operation at the new Cherokee generating station north of Denver. In October 1957, the first steam-electric unit rated at 22,000 kw began operation at Cameo station just east of Grand Junction. The second unit at Cherokee station, a 110,000-kw steam-electric unit, is under construction and is scheduled for commercial service in 1959.

During 1957 approximately 32 miles of 115-kv transmission lines were placed in service and approximately 16 miles of 69-kv lines were added in the Grand Junction area. The transmission substation capacity was increased by 201,500 kva, including a new 130,000 kva, 115/13-kv transformer bank for the gener-

ating unit at Cherokee station and a new 33,333-kva, 69/13-kv transformer bank for the generating unit at Cameo station. Additions to the distribution substation capacity to serve load growth totaled 55,500 kva. Included in this total is a new 41,667-kva, 115-kv distribution substation now in service in Denver. Approximately 9,000 new electric customers were connected during 1957. The maximum peak demand on the company's system is expected to be 550,000 kw occurring in December. This will exceed the demand in 1956 by 8.37%.

The 1958 transmission construction program includes 117 miles of line. Expenditure on distribution facilities for 1958, in addition to extensions, services, etc., will provide 40,000 kva of substation capacity at various locations including two 115-kv substations in Denver.—**K. M. Koch, vice-president in charge of electric operations.**

Southern Colorado Power

Adding 22,000 Kw at Canon City

Our most important project during the past year has been the authorization, financing, engineering design and finally start of construction of a 22,000-kw generating unit addition to our Canon City plant. Completion is expected in the spring of 1959.

Our transmission facilities have been further expanded by construction of a 74-mile, 115-kv transmission line between Pueblo and La Junta, Colo.

We have also participated in the construction of a 115-kv transmission line between Canon City and Salida, Colo. This line will serve as an interconnection with the Public Service Co. of Colorado.

On April 2, 1957, we suffered major damage to our transmission and distribution system from a very severe sleet and snow storm accompanied by high wind. It was only by heroic efforts of all of our employees that customer outage was limited to two to five days, although actual repairs required two or three months. Total damage was approximately $250,000.

A three- or four-year program to ring the city of Pueblo with a 69-kv subtransmission system has been two-thirds completed, one of the proposed 7,500-kva, 69/13.8/7.6-Y substations has been energized, and a considerable amount of conversion from 4.16 kv to 7.6 kv has been accomplished.—**W. C. Porter Jr., vice-president in charge of operation.**

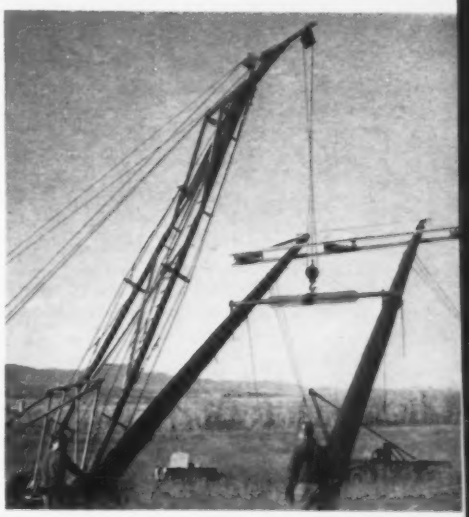
Western Colorado Power

(See Utah Power & Light Co.)

Idaho

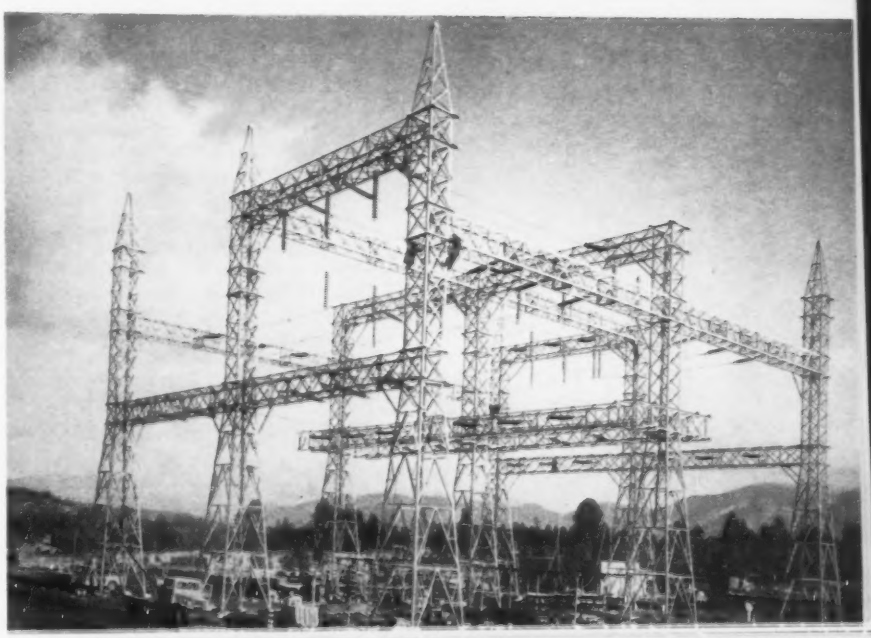
Albeni Falls Dam
Army Engineers

Albeni Falls Dam is now fully completed and operating.



(Above) PS of Colorado's new Cherokee station brought Unit No. 1 in 1957, additions are scheduled for 1959 and 1961

(Right) Colorado Springs utility hoists H-frame into place. (Below) Flagstaff terminal of Arizona PS's new 220-kv line



Stiffleg derrick helps Idaho Power bring in Brownlee Dam's 360 mw in 1958

Idaho Power

Biggest Budget Ever

The year 1957 witnessed the largest construction program in Idaho Power Co. history, totaling some $48,948,000. Much of this outlay was spent on power-generation projects, with the remainder going for transmission lines and substations.

Even more will be spent in 1958: $61,850,000. The company will complete the 360,400-kw Brownlee hydroelectric project and take long strides in construction of Oxbow hydroelectric project, both in Hells Canyon on the Snake River.

1957 Record

In 1957, 100 miles of steel-tower transmission line were constructed from the Brownlee project to the Boise Bench substation and the stringing of one circuit was 50% completed. A 230/138-kv substation at Brady, near American Falls, Idaho, was partially energized. This station will contain 400,000-kva name-plate rating of step-down transformers. An initial 40,000-kva synchronous condenser was installed and made operative. Expansion of a similar substation at Boise, having a transformer name-plate rating of 300,000 kva, was approximately 70% complete.

A 42-mile section of 230-kv transmission line was completed and energized from Baker, Ore., to the Brownlee project. A new 69-kv transmission system was completed from Brownlee to Halfway, Ore., to serve the areas immediately adjacent to the project. An addition to the company's microwave system was made, extending westward to LaGrande, Ore. This now provides a continuous path from the company's western terminus at LaGrande, Ore., to Pocatello, Idaho, on the east. The company added several new distribution substations, together with the enlargement of existing stations to handle normal load growth.

The 1958 budget also provides for the energization of the new Boise-Brownlee 230-kv double-circuit steel-tower line and the raising of voltage from 138 to 230 kv of the 190-mile Boise-Brady transmission line. The 230/138-kv stations at Brady and Boise will be completed during the year, including installation of a 60-mw synchronous condenser at each of these locations.

Brownlee construction is being pushed to completion by some 2,000 builders, with most phases of the huge development active around the clock. The fast-rising dam will be 1,380 ft long and will tower almost 400 ft above its bedrock foundation to stand as the world's second-highest rock-fill dam.

Preliminary work at Oxbow began in 1957 and will swing into high gear in 1958. Located 12 miles downstream from Brownlee, the Oxbow development will have a generating capacity of nearly 200,000 kw.—**J. F. Emery, superintendent, electric operation and construction.**

Palisades Project, USBR

Both the contracts for construction of Palisades Dam and power plant structure and for completion of the power plant were virtually completed at year's end. The power plant, comprising four 28,500-kw units, will have a total installed capacity of 114,000 kw. Unit No. 3 was placed in commercial operation in February of 1957, followed by unit No. 2 in May and unit No. 1 in August. Unit No. 4 is scheduled to go on the line early in 1958. The power plant is providing hydroelectric energy to serve irrigation pumping, municipal and rural cooperative loads, as well as serving as fuel replacement energy.

Pacific Northwest Power

Under Way in '58?

Pacific Northwest Power Co., which has attempted for the past three years to build a major hydroelectric project on the controversy-loaded Snake River, has entered the new year on a "still waiting" basis.

The company—organized in 1954 by Washington Water Power, Pacific Power & Light, Portland General Electric and Montana Power Companies—now awaits a final decision from the Federal Power Commission on its 1,500,000-kw, $234,000,000 proposal to build Mountain Sheep and Pleasant Valley Dams below Hells Canyon.

PNP located its project above the mouth of the Salmon and Imnaha Rivers to protect important fish runs in those streams.

The company had filed for its license in September 1955. The bulk of 1956 was taken up in lengthy technical hearings before the commission.

The FPC on Nov. 26 heard final oral argument from all parties. Earlier last year the commission's chief examiner, Edward B. Marsh, issued an initial decision granting PNP a license to build the big multipurpose project, stating it was the "best approach to a comprehensive plan for improving and developing this stretch of the Snake River."

This was in opposition to a finding of the FPC legal staff that PNP be denied its license on the grounds that a project at Nez Perce, blocking the Salmon River, would be a better scheme of development. However, all responsible fish biologists have testified there is no proven method to pass fish over such a barrier as Nez Perce, and both regional and national fish and wildlife interests have raised unalterable objections to that structure. On the other hand they have voiced approval of the Mountain Sheep-Pleasant Valley plan. Present intervention has stemmed from the public power bodies, spearheaded by the National Hells Canyon Assn.

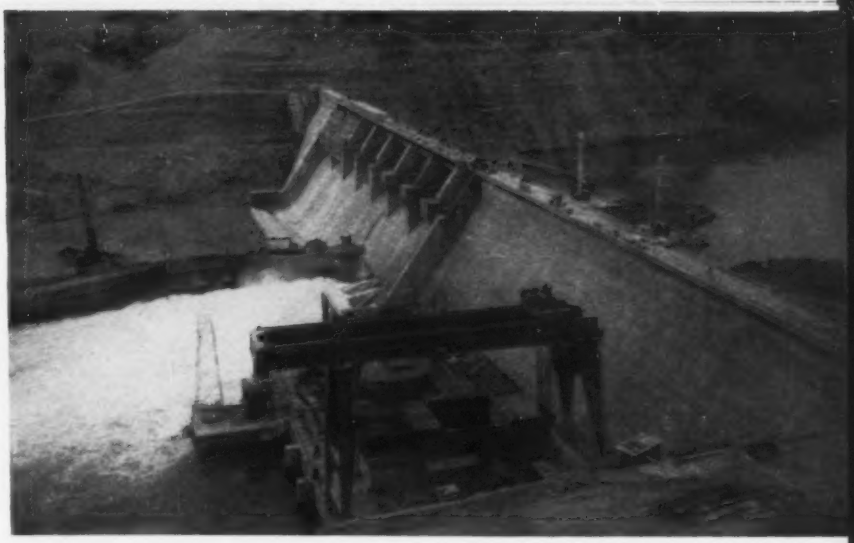
Delays faced by PNP have upset the original production date of 1959-60, and already raised construction costs $20,000,000. To date the four companies have made preliminary expenditures of over $2,500,000.

Final approval could come any time, and PNP has expressed willingness to get the project under way immediately following such action. **—Clem Stearns, public relations coordinator.**

Montana

Libby Dam
Army Engineers

There is no change in the status of Libby Dam as of a year ago.



Cochrane Dam's two 30-mw generators will add to Montana Power's reserve in 1958

Montana Power

Cochrane on Line in '58

Projects designed to increase generating capability and strengthen transmission capacity highlighted the 1957 construction program of the Montana Power Co. At year's end, the 60,000-kw Cochrane hydroelectric development on the Missouri River was in its final stages of construction and the first leg of a second 161-kv transmission line between the Kerr hydroelectric plant and the smelting load center of Anaconda had been completed.

The Cochrane plant, located near the city of Great Falls, will be the fifth hydro development on that stretch of the Missouri River and will bring total generating capability of that region to 220,000 kw. Initial production from the plant is expected in February 1958.

Constructed during the year was a 57-mile, 161-kv transmission line between Kerr plant and the Rattlesnake substation near the city of Missoula, together with added transformation and terminal equipment at Kerr and an installation to convert the Rattlesnake site to a switching station. This line will be extended to Anaconda, giving the company two 161-kv lines into that area from the Kerr plant.

The company's extensive microwave system also was extended during the year with the installation of the west leg into Missoula and other sections of western Montana. The north leg into Canada was completed in 1956 and the final installation, linking the company's eastern system with Butte, will be started in 1958.

Major service improvements included the construction of a new substation serving the city of Missoula and installation of a 15,000-kva autotransformer bank in that city to serve the Bitterroot valley; construction of a substation to supply a new pulp mill west of Missoula; construction of a 44-kv line and substation to supply lumbering operations east of Missoula; additions to the substation capacity serving Butte and the Big Hole valley, and installation of a new feeder serving an oil refinery at Great Falls.

In addition to completion of the Cochrane project in 1958, the year's major projects include construction of a line and substation to serve an Air Force radar station in central Montana, work on the second leg of the Kerr-Anaconda 161-kv line, construction of a new service center in the city of Missoula and completion of the system microwave facilities.—**Colin W. Roff, vice-president.**

Missouri River Basin Project, USBR

(See report under Wyoming.)

Nevada

Sierra Pacific Power

No Slump in Construction During '58

The over-all load growth on Sierra Pacific's electric system in western Nevada and eastern California continues upward at a consistent pace despite the detrimental effect of curtailed mining operations, which has caused a decrease in industrial sales. Residential and farm average annual use now exceeds 4,900 kwh. The connection of new customers in 1957 including primary lines, transformers, services, meters and related materials accounted for $1,200,000 of the year's construction total of $2,500,000.

Further distribution improvements approximating $600,000 consisted principally of three 2,500-kva unit substations with their related feeders, one being located at Stead Air Force Base and the remaining two in the city of Reno.

Additional subtransmission improvement was made north and east of Lovelock, Nev., by the construction of 46 miles of new 60-kv pintop line in the Humboldt Valley, replacing the old No. 4 gage stranded copper line with No. 4/0 ACSR conductor on 580 new poles.

The anticipated expenditures of $2,600,000 for 1958 will again include about $1,200,000 for the connection of new customers; three additional 2,500-kva unit substations for the cities of Reno and Sparks; a 5,000-kva transformer and regulators for the fast growing South Lake Tahoe area; a 5,000-kva substation at Squaw Valley, scene of the 1960 Winter Olympics; and an additional 10,000-kva, 60/23-kv unit for the Valley Road switching station at Reno. A start will also be made in 1958 toward the construction of an additional 14 miles of 60-kv line from Truckee, Calif., to the North Lake Tahoe area.—**M. H. Atcheson, chief engineer.**

Southern Nevada Power

'58 Expenditures Down From '57

The construction work for 1957 consisted primarily of increasing production capacity with the accompanying increases in transmission and distribution lines and substation equipment at a cost of approximately $5,577,560.

The installation of the 66-mw No. 2 unit at Clark was completed in July and ready for commercial operation in August. The Clark 66-mw No. 3 unit is scheduled for late 1960 or mid-1961.

The construction program for transmission consisted of 11.5 miles of 138-kv line and 17.6 miles of 69-kv lines. The 17.6 miles of line extend from Mercury to Jackass Flats to serve the AEC. This line is designed and spaced for 138-kv; however, it is presently being operated at 69 kv.

The 1957 substation construction consisted of two 138-kv substations; one located at the Clark station where it is tied to the 69-kv bus through a 75,000 kva, 138/69-kv autotransformer; the other is located at the westside substation where it ties into the 69-kv loop and the Mercury line through a 75,000-kva, 138/69-kv autotransformer. At Jackass

A rear view of New Mexico PS's Person station. Station capability is 110 mw

Flats a distribution substation was built consisting of a 5,250-kva, 69/12.4-kv transformer and three 14.4-kv circuit breakers.

Five microwave and supervisory control stations were placed in operation. This equipment gave complete control of all 69-kv breakers in the five substations and in addition telemetering and communication. Twenty-seven miles of 12-kv distribution lines were added plus the normal extensions for customer services.

The budget for 1958 will amount to $3,016,900. This will consist of a circulating water treatment plant and reservoir for Clark station; two 69-kv switching stations; an addition of 9,375-kva capacity to one substation and the addition of regulators and feeders to another substation. The budget also calls for microwave and supervisory control and telemetering in two substations and wired supervisory control and telemetering in two other substations.

In addition the budget calls for additions and improvements to the distribution system in the amount of $868,500.—**Dwight R. Hoopes, chief engineer.**

New Mexico

Public Service of N. M.

1957 *Peak Up* 11.5%

In November 1957, the fourth unit at Person station, with net capability of 33,500 kw, was placed in service. The first installation at the new Reeves station, a 44,000-kw unit, was started in October 1957 and is scheduled for operation in November 1958.

Early in 1957, construction began on a 115-kv transmission system that will link the four generating stations of the system and also connect with the Atomic Energy Commission at Santa Fe, N. M., and the United States Bureau of Reclamation system at Albuquerque. Completion is expected early in 1958.

A microwave system for communication, supervisory and telemetering operation for the Albuquerque area was completed in the fall of 1957.

Total construction expenditures for the two years (1957 and 1958) will exceed $19,500,000.—**M. C. Heffelman, vice-president, operations.**

Rio Grande Project, USBR

Completed in April was the contract for reconductoring the 72-mile, 115-kv, wood-pole transmission line running from the Bureau's Elephant Butte Dam north to the Socorro substation.

Oregon

Bonneville Power Administration

Transmission Facilities for 2,300 Mw Peaking Capacity in '58

Peak energy demand on the federal plants was 5,024,000 kw, 5 to 6 p.m., Nov. 21, 1957. This new all-time high of demand was made possible by the addition of 11 generating units during the year totaling 643,000 kw. Units included Chief Joseph Nos. 5, 13, 14, 15 and 16, 320,000 kw; McNary Nos. 13 and 14, 140,000 kw; and The Dalles fishway Nos. 1 and 2, 27,000 kw, and main units Nos. 1 and 2, 156,000 kw.

U. S. Columbia River federal plants produced 31,350,000,000 kwh for Bonneville Power Administration during 1957 for distribution over the BPA transmission system to 115 customers. Revenue from the sale of this power was $67,700,000 for 1957. Increases over the 1956 calendar year were: peak demand 4.8%; generation for BPA 8.6%; revenues 7.7%.

Expenditures for new and improved facilities during 1957 amounted to about $26,000,000, including $5,000,000 in contract construction. Approval of the present budget before Congress will provide an estimated $25,000,000 in 1958, including $4,000,000 in contract construction. The estimate is based on a transmission line program that will keep pace with the schedule of additional generating plant installations.

Transmission system additions during 1957 included completion of 314 circuit miles of high-voltage transmission lines and 1,134,700 kva of added transformer capacity. Plans for 1958 call for construction of about 160 miles of high-voltage transmission line, with added transformer capacity of 1,020,160 kva.

Other important Pacific Northwest 1957 additions included the 250,000-kva transformer bank at Big Eddy substation, for service to The Dalles area, the Big Eddy-Oregon City-Chemawa 230,000-v transmission line to reinforce Willamette Valley power supplies, the Alvey-Reston-Fairview 230,000-v transmission line to augment power flows to southwest Oregon, the Big Eddy-Chenoweth-Harvey 115,000-v circuits and the Chenoweth and Harvey substations serving the Harvey Machine Co. aluminum plant at The Dalles, and other area customers, and the Redmond-Round Butte 230,000-v transmission line to coordinate new generation of the Pelton project of the Portland General Electric Co. with the BPA grid.

Congressional appropriations for the new fiscal year, which began July 1, 1957, provide transmission facilities for 2,330,000 kw of new peaking capacity, representing scheduled generator installations on the U. S. Columbia River system, and nonfederal plants where wheeling arrangements are being undertaken. Transmission additions for the coming year will focus largely on facilities to carry new generation from federal plants such as Chief Joseph

and The Dalles Dams and nonfederal power plants where wheeling arrangements are contemplated, such as Priest Rapids, the Swift project, Rocky Reach, Mayfield and Pelton. **—Wilbur P. Staats, information officer.**

California Oregon Power

Big Bend Hydro Plant Complete in '58

Major items of construction completed during 1957 were:

1. Completion of the Eagle Point hydro plant.
2. The installation of a 37,500-kva, 125/66-kv transmission substation in Del Norte County.
3. The installation of 37,500-kva, 125/66-kv transmission substation at Weed, Calif., known as the Weed substation.
4. Partial completion of a 33,000-kva, 230/125-kv transmission substation at Chiloquin, Ore.
5. Completion of 25 miles of the proposed 230-kv transmission line between Medford and Klamath Falls, which line will be used to transmit power from the Big Bend plant on the Klamath River.
6. Installation of transmission lines and 10,000-kva substation to serve the Johns-Manville pulp plant at Chiloquin.
7. Completion of operating center consisting of new office building, warehouse and garage at Yreka.

Major items of construction that will be completed during 1958 are:

1. Completion of the Big Bend hydro plant.
2. Completion of the 230-kv transmission line between Medford and Klamath Falls.
3. Completion of the transmission substation at Chiloquin started in 1957.
4. Installation of new 125-kv switching station at Copco, Calif.
5. Continuation of preliminary plans for development of additional hydro plants.—**J. C. Boyle, vice-president and general manager.**

John Day Dam
Army Engineers

Core drilling and exploratory work at the John Day Dam site on the Columbia River continued in 1957 with final core drilling contract at River Mile 216.3, amounting to $157,679.50, scheduled for completion February 1958. As of the close of the year, this contract was rated 19% complete. A million-dollar appropriation was made available for John Day in the fiscal year 1957-58 budget. These monies will be expended for continuation of detailed designing and for the building of access roads to the dam site and exploratory work.

Portland GE's 120-mw Pelton power facilities are hidden during spillway tests

McNary Dam
Army Engineers

All 14 generators have been installed at McNary Dam and during the calendar year 1957 the output of all 14 units operating at above capacity recorded an output of more than 1,000,000 kw.

Pacific Power & Light

New Capacity to Double Existing Plant in '58

Another record capital outlay for new construction is scheduled by Pacific Power & Light Co. during 1958 when new hydroelectric and steam-electric power capacity will more than double the company's existing plant.

The 1958 budget provides for $58,900,000, as compared with the previous year's record of $55,040,000 actually expended in 1957. PP&L has expended more than $170,000,000 for construction since 1950.

Completion of the generating plants will require an estimated $40,628,000 for plants and related transmission and $3,754,000 for other transmission including 155 circuit miles, 69 kv or above. Substation capacities of 501,000 kva will connect the new plants. Distribution facilities, including 475 miles of line and transformer capacities of 83,000 kva, will require $11,189,000.

Growth of the Pacific Power area during 1957 boosted the number of electric customers served by the company to a new high of 277,757, and their use of electricity increased to 3,762,113,000 kwh. The average annual kwh use by residential customers also was at a new record rate of 6,917 kwh.

The power development program on the 204,000-kw Swift No. 1 project on the Lewis River in southwest Washington passed the half-completed mark in December. The earthfill embankment, which will be the world's highest at 512 ft, is 300 ft above its foundation and ahead of schedule. Cutting of the forebay was completed and driving of the 25-ft-diameter, 1,535-ft-long power tunnel is well advanced.

Expansion of the Merwin project power house and installation of a third 45,000-kw turbine-generator at this pioneer Lewis River plant is one-third along, with final concrete for the walls and roof poured late in December.

Pacific's 100,000-kw Dave Johnston steam-electric plant near Glenrock, Wyo., is one-third completed and already a towering landmark along the North Platte River west of Casper. The erection of the six 300-ton steel silos, the station building and turbine-generator pedestal were almost finished. Steel was being erected for the 182-ft-high boiler structure. Also under way was the building of a 12-mile haul road from the coal field to the plant. Installation of the generating equipment is scheduled to begin in May.

Pacific's schedule calls for the Mer-

win unit to go into service in August, the Dave Johnston plant in October and the Swift project in December.

Aside from purchase contracts covering 221,000 kw of the future output from Priest Rapids, Wanapum and Rocky Reach projects on the Columbia River, Pacific has other power development plans looking toward future supply.

Pending before the Federal Power Commission is an application to build the 110,000-kw Muddy project upstream from Swift No. 1 on the Lewis. During 1957, PP&L conducted investigations in the Meadows area of the same river under a preliminary FPC permit. Similar preliminary hydroelectric investigations are being made in the Eden Ridge area on the south fork of the Coquille River in southwestern Oregon. Coal deposits in an adjacent mountain are being explored for possible use in a 100,000-kw or larger mine-mouth steam-electric plant.—**Paul B. McKee, president.**

Portland District

Army Engineers

The Portland District, Corps of Engineers, has three projects under construction that include power development.

The Dalles project, located on the Columbia River three miles east of The Dalles, Ore., is being constructed with an initial installation of 14 78,000-kw main units, two 13,500-kw fish-water supply units and two 3,000-kw station service units. Power house substructure to increase the ultimate installation to 22 main units has been provided with the initial construction. The first fish-water unit started commercial production of power during May and the second fish-water unit was put on the line during June. Main unit No. 1 went on the line during September and No. 2 went on during October. Subsequent units are scheduled one every three months until November 1960 when No. 14 will be completed.

Construction of the spillway dam, power house substructure for units 1 to 22 are complete, and the superstructure for units 1 to 14 is progressing. Water has been impounded to normal pool elevation 160 and the navigation lock is in operation.

Hills Creek project on Middle Fork Willamette River about 45 miles southeast of Eugene, Ore., or 26.5 miles upstream from Lookout Point Dam, will consist of a flood control reservoir and a power house. The power installation will be two 15,000-kw units. Construction is under way with clearing of the dam site and reservoir area. The diversion tunnel has been completed. Contract for dam and appurtenances has been awarded and work is in progress.

Cougar project on South Fork McKenzie River, about 44 miles east of Eugene, Ore., will consist of a flood control reservoir and a power house. The initial power installation will be two 12,500-kw units. Construction is under way with clearing of the dam site and reservoir area. The diversion tunnel has been completed. Initiation of construction of the Cougar Dam has been deferred until fiscal year 1959.

Portland General Electric

T & D Construction Up 50%

Expenditures in 1958 for new transmission and distribution construction and normal system improvements will amount to $15,500,000. This compares with $10,700,000 spent for similar construction in 1957.

An additional $12,000,000 will be spent for the completion of the 120,000-kva Pelton hydro project on the Deschutes River and the 72,000-kva combined North Fork and Faraday projects on the Clackamas River. No. 1 generator at Pelton went into commercial operation in December 1957. Generators 2 and 3 will follow at two-month intervals. The North Fork and Faraday projects will be ready for operation by early fall 1958.

The year 1958 will mark inauguration of a high-voltage transmission system to overlay the present 57-kv grid in the Willamette Valley. One new 230-kv and three new 115-kv major switching stations will be built during the year to start the program.

Eight new distribution substations having a combined capacity of 55,000 kva will be added during the year. Capacity increases at nine other stations will contribute an additional 42,000 kva of installed transformer capacity.

The program for relighting the streets of the city of Portland will be virtually complete early in 1958. **—W. D. Smith, chief planning engineer.**

Rogue River Basin Project, USBR

Green Springs power plant, which will be the Bureau of Reclamation's highest head power installation, was placed under construction in July. A feature of the project's Talent Division near Ashland in southwestern Oregon, the 16,000-kw plant will operate under an 1,800-ft head, about 600 ft higher than any existing Reclamation power plant. The plant's single generating unit will be driven by a vertical shaft, multinozzle, impulse-type turbine. Both the generator and the 23,500-hp turbine are under contract for fabrication. Construction began in October on the power conduit and tunnels which, together with the plant's penstock, will deliver water to the power plant from the project's Keene Creek Dam, also under construction. The total length of the conduit, tunnels and penstock is about four miles. The plant is scheduled to be placed in service in the spring of 1959.

Utah

Utah Power & Light

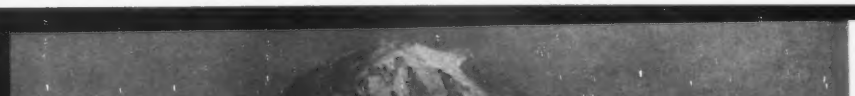
Transmission Construction Active in '58

The year 1957 marked another period of expansion for the Utah Power & Light Co. This company, serving parts of Utah, Wyoming and Idaho, and its subsidiary company, The Western Colorado Power Co., serving southwestern Colorado, spent $21,700,000 for new facilities in 1957.

Completion of the 100,000-kw No. 2 unit in the mine-mouth Carbon plant required the largest expenditure, some $6,400,000. Power from this mine-mouth unit will be used partially to supply growing uranium mining and milling and oil field pumping loads in southeastern Utah, with surplus power being transmitted to the Salt Lake City area.

Approximately $6,200,000 were spent for transmission facilities which included 337 miles of transmission line and 183,000 kva of additional transformer capacity. Included in the transmission line mileage was 115 miles of 138-kv line to transmit power from the new Carbon unit to the Salt Lake City load center. The company also, as part of its long range expansion program to meet the future power needs of southern Salt Lake valley, constructed a new million-dollar, 138/44-kv substation near Midvale to tap the new Carbon plant-Salt Lake City 138-kv line.

Expenditures for extending distribution facilities to new customers, including 157 miles of distribution line and 60,000 kva of distribution substation transformer capacity, totaled $6,500,000. General system



items cost approximately $600,000.

Utah Power & Light Co. and its subsidiary have budgeted $13,400,000 for the year 1958. The largest item of expenditure scheduled for 1958 is a new office building to be constructed adjacent to company's operation center in Salt Lake City at a total cost of approximately $1,800,000. It is planned that the administrative, general accounting, business development and legal departments will occupy this new three-story building in early 1959, vacating the present headquarters, which they occupied for many years. The Salt Lake division business offices will move in early 1958 into a recently purchased building in downtown Salt Lake City.

1958 Transmission

Expenditure of $4,100,000 for 1958 transmission facilities include 155 miles of transmission line and 147,000 kva of transmission substation capacity. The transmission mileage includes a line from the Montpelier, Idaho, substation to Georgetown Canyon to serve 35,000 kw of interruptible phosphorous furnace load scheduled to be on the line in the fall of 1958.

Also in 1958 Utah Power & Light Co. plans to spend $800,000 to electrify oil fields in southwestern Utah. Transmission facilities constructed will supply electrical energy for crude oil pipe lines and oil well pumping from the many pools in this area.

Distribution facilities to serve new customers and improvements to existing distribution facilities, including $283,000 in the Aneth oil field, are estimated to cost $6,300,000 in 1958.

Expenditures for normal improvements to production facilities and general system improvements round out the total figure of $13,400,000. **—E. A. Hunter, administrative assistant.**

Weber Basin Project, USBR

Work continued during the year on construction of the project's Wanship and Gateway power plants.

Provo River Project, USBR

At the end of the year, construction of the 5,000-kw Deer Creek power plant and switchyard was essentially completed. The plant, which will house two 2,500-kw generating units, is at Deer Creek Dam on the Provo River near Provo, Utah. The plant is expected to be placed in service early in 1958. Construction began in October of a 2,000-ft, 46-kv tie line which will extend from the power plant to a transmission line of the Utah Power & Light Co.

Washington

Chief Joseph Dam Army Engineers

Five power units were placed in commercial production at Chief Joseph Dam during 1957, raising the total number of generators on the line to 12. Each with a rated capacity of 64,000 kw, the project figure was raised 320,000 kw to total 768,000 kw.

The final four units of the 16 in the initial installation are scheduled to begin operation in 1958. That will add 256,000 kw hydro generating capacity for a total of 1,024,000 kw. Place for expansion of this Columbia River plant in north-central Washington by addition of 11 more power units has been provided in the project planning. This eventuality is dependent upon development of more upstream storage and appropriation of construction funds by the Congress.

From an original investment estimate of $206,000,000 in the authorizing document, requirement for federal funds has been reduced to a current estimate of $148,000,000, according to project figures in the office of Colonel R. J. B. Page, Seattle District Engineer of the Army Engineers.

Columbia Basin Project, USBR

Completed in October was the installation of the floodlighting system for the Grand Coulee Dam spillway. The floodlighting display consists of various combinations of five different colors projected on the water falling over the spillway surface. The display repeats at 30-minute intervals. At one period of the cycle all five colors are displayed. The system will be placed in operation next spring.

Cowlitz County PUD

Swift Creek Adds 70,000 *Kw in* 1958

During 1957 Cowlitz County Public Utility District expended approximately $1,000,000 in over-all system improvement and construction. Plans for 1958 call for an expenditure of approximately an additional million dollars for new construction and distribution improvement.

This past year saw the start of two new substations and one switching station. In 1958 one additional substation is planned for construction.

In September 1957 bids were opened and construction started on a new office building to house all administrative operations of the district. The bid was awarded to a Longview contractor, K. T. Henderson, for a total price of $330,725. This new building, when completed, will have approximately 20,000 sq ft of usable office space. Construction is expected to be completed in March 1958 with occupancy around April 1, 1958.

Also during 1957 the distribution and street lighting system in the town of Castle Rock was completely modernized at a total cost of approximately $100,000.

The District's Swift Creek hydroelectric project is well under way and construction is scheduled for completion in December 1958. This project will add 70,000 kw of generating capacity to the district's resources.—**R. L. Elmgren, assistant to the manager.**

Grant County PUD

Priest Rapids Capability Upped to 630,000 *Kw*

Construction of Priest Rapids Dam was approximately 33% complete by Jan. 1, 1958. The work is reported to be ahead of schedule.

An estimated sum of $38,615,000, including interest on the bonds, was spent on the Priest Rapids development through December 1957. It is estimated that $45,682,000 will be expended during 1958.

Plans for 1958 call for the power house to be completed to a point where the contractor can begin to install turbines and generators in the latter part of the year. It is expected the first commercial power will come on the line about July 1960.

Plans are now being formalized to add units 9 and 10 to the eight generators originally planned for the dam. These generators will be paid for from the contingency fund, and no extra bonds will have to be sold to finance the $7,000,000 installation. The extra generators will be placed in bays provided in the original plans for the power house, and will add 166,000 kw of peaking capacity to the name-plate total of 630,000 kw for the first eight units.

143-ton condenser moves toward Tacoma City Light's Cowlitz distribution sub

Slightly more than 200,000 cu yd of concrete have been placed, representing about 24% of the concrete that will be required for the entire job. Fourteen million pounds of reinforcing steel have been placed of the 60,000,000 lb that will be used on the job.

The Harza Engineering Co. of Chicago is in charge of the design and is supervising the construction on the job. — **G. A. Smothers, manager.**

Ice Harbor Dam Army Engineers

At Ice Harbor Lock and Dam, the farthest downstream of four authorized multipurpose projects to provide slackwater navigation, hydroelectric power and other beneficial water-use development on the lower Snake River, two major contracts were in effect. The south shore construction contract, held by Montag, Halvorson, Austin & Associates for $29,557,625.24 calling for placing embedded items, reinforcing steel and concrete in 7½ spillways, stilling basin, nonoverflow dam section, fish ladder, pumphouse and pumphouse intake section as well as placing random rock fill in the south shore fishway, was rated as 43.7% complete with completion date scheduled for March 3, 1959. A 40-day time extension was allowed the contractors because of strikes and curtailment of work during 1957. As of the close of the year, however, the contractors were about on the original planned schedule due to exceptionally favorable weather, which permitted concrete placement throughout December.

The second contract in effect at Ice Harbor is for relocation of the Spokane, Portland, and Seattle Railway and the construction of necessary access roads. Amounting to $1,006,601.08, the contract is held by R. A. Heintz Construction Co.

Lower Monumental Lock and Dam, Army Engineers

Lower Monumental Lock and Dam is the second of the four authorized dams on the lower Snake River receiving an allotment of $500,000 for the fiscal year ending June 30, 1958, for advance engineer planning and design.

The dam is located 35 miles upstream from Ice Harbor Dam and in design and generating capacity will, to a large degree, resemble the Ice Harbor installation. No date for power on-the-line or for start of construction work is scheduled.

Puget Sound Power & Light

Baker River Project Continues

During 1957 construction of the company's 158,000-kw Baker River project was continued on schedule. All temporary construction work was completed, the reservoir is being cleared and the work of pouring the concrete dam was 15% complete by the end of the year. During the fall of the year contracts were let for the construction of a barrier dam and fish trapping facilities, together with a third penstock for the lower Baker River power house. Work on this portion of the project has also been started.

Construction of a 22,000-kw enlargement of the Snoqualmie Falls hydroelectric plant, including a new 55-kv switching station, was completed and placed in service in July 1957.

Two new line headquarters buildings, located at Burlington and Puyallup, were completed during the year and a third at Factoria, near Bellevue, was started.

During the past year, 12 miles of transmission line were built. Transmission substations at Snoqualmie, Eastside, Bellingham and South Bremerton were increased in capacity by a total of 161,000 kva. Twelve new distribution substations with a total capacity of 60,000 kva were constructed during 1957 and 20 existing substations were increased a total of 50,500 kva.

In 1958 Puget plans to continue the construction of the Baker River project. In addition, it is planned to construct about 20 miles of transmission lines and add 234,000 kva of transformer capacity in one new and three existing transmission substations. Capacity of distribution substations is expected to be increased 70,000 kva by the construction of six

Falling water makes a spectacular view at Army Engineers' McNary Dam's spillway

new substations and by increasing the capacity of 11 existing substations.

Total plant expenditures for the year 1958 are currently estimated at about $29,700,000 of which $16,400,000 will be for production plant improvements, $2,500,000 will be for transmission plant, $9,500,000 will be for distribution plant, including expenditures to serve new customers, and $1,300,000 will be for general plant improvements. — **Frank McLaughlin, president.**

Seattle City Light

'58 Expenditures Up $9,000,000

During the year 1957, the total expenditures for additions to plant amounted to $16,800,000. This expenditure was distributed among the various plants as follows:

Hydraulic plant	**$6,850,000**
Transmission plant	**700,000**
Distribution plant	**6,350,000**
General plant	**2,900,000**

Hydraulic Plant — Plans for the expansion of hydroelectric plant will include the continued construction on the new Gorge Dam. The intake structure and tunnel will be completed and excavation for the gravity spillway section will commence early in the year. The pouring of concrete will be sufficiently completed, during the year, to allow work to begin on the second stage care and diversion of the river for the arch section of the dam.

Contingent upon the granting of a license for construction of the dam at the Boundary site of the Pend Oreille will be the preliminary work to construction, and the care and diversion of the river.

Scheduled work at our Diablo plant will be the installation of the two new turbine runners and possible modification of the surge tank and tunnel grouting.

Planned improvements at our Cedar Falls plant will be conversion to automation, replacement of wood stave penstock with steel and modernization of headworks facilities. A contract for replacing the wood stave penstock and approximately 3,400 ft of 78⅛-in. ID steel pipe, the construction of three bridge catwalks and miscellaneous allied work will be let early in 1958.

The anticipated expenditure for all hydroelectric plant expansion is $14,669,000.

Transmission Plant — Additions to our transmission system will be the completion of our rebuilding of the Cedar Falls 55-kv lines to 115 kv, and the conversion and remodeling of the switching station to 115 kv for the plant automation.

Also planned is the acquisition of right-of-way for a future 230-kv transmission line.

Total expenditure for transmission plant is estimated to be $1,058,000.

Distribution Plant—Expenditures for distribution plant expansion will amount to $7,050,000.

Planned additions include an increase of 62,000 kva in our unit substation capacity, the completion of the conversion of South substation banks to forced-oil-air cooling giving an increase of 24,000 kva, a new 62,500-kva bank for our Shoreline substation, and conversion of two 13-kv substations to 26 kv.

Other construction items that are included in the above expenditure estimate are 20 miles of 26-kv circuits, primary and secondary lines, services and meters, underground network expansion, reactive requirements and relocation work caused by highway projects.

General Plant—The major item in general plant construction will be the continuation of construction on the seven-floor tower addition to the City Light Building. The tower and remodeling of the existing building was started July 1957 and it is scheduled for completion and occupancy by the end of 1958.

This entire program will require an estimated total expenditure of $25,545,000 during 1958. — **H. V. Strandberg, chief engineer.**

Snohomish County PUD

Demand Growing 9% Annually

A new service headquarters and office building was completed at Halls Lake in February 1957. A similar building was started in the town of Arlington, and will be completed the early part of 1958.

As of Dec. 1, 1957, the district filed an application with the Federal Power Commission for a license for a multipurpose project on the Sultan River. The project will produce approximately 300,000,000 gal of usable water per day and 141,000 kw of electric energy.

At the close of the year the district showed an increase of more than 1,100 new customers for the 12-month period. The system demand is growing at the rate of 9% annually.

Budgeted for the year 1958 for new and improved facilities is an amount of $2,681,387. Plans are made for a new waterfront substation and the completion of the Monroe-Snohomish 55,000-v line, the Murphy's Corner-Wintermute's Corner 12,000-v line and the Snohomish substation No. 2 third circuit.

Construction of a new administrative building in Everett is expected to get under way this spring. The general service headquarters consisting of a service headquarters building and storeroom, a garage and a transformer repair shop were occupied in 1955 and this building will complete an All-Electric Center, which will be the headquarters for all operations in Snohomish County. —**A. S. J. Steele, manager.**

Tacoma City Light

Delays on the Cowlitz

Tacoma is a better lighted city for having completed in 1957 the installation of more than 2,000 units and some 85 miles of mercury vapor street lighting in its program to modernize and provide adequate illumination on streets and thoroughfares. There were 659 of these units installed and 22.5 miles of streets lighted this past year.

Major accomplishment in the way of new construction on the electric system includes a 150/187.5/250,000-kva, 230-105-kv transformer bank, and the installation of a 143-ton, 40,000-kva hydrogen-cooled rotary condenser at the Cowlitz substation; also, the erection of an $80,000 reinforced concrete barrier wall in the stream bed below Cushman Dam No. 1. A 12,000-kva substation was completed at Gig Harbor to serve the Peninsula Light Co. and there were two 7,500-kva distribution substations added in Tacoma.

One project well under way provides for the construction of a new 10,000-kva substation to serve the McChord Field Air Force Base. Another to commence soon after the first of January will provide for the erection of a second 230-kv transmission tie with the Bonneville Power Administration.

The practical completion of excavation for the dam and the power house at the Mayfield site on the Cowlitz River had been accomplished by March 1, 1957, when all construction work on the project was halted because of a decision by the State Supreme Court which adversely affected Tacoma. An appeal filed by the city will be heard by the Supreme Court of the United States and a favorable decision is anticipated. Construction will be resumed with as little loss of time as possible. However, the termination of the general construction contract

on Nov. 6 has placed the city in a position of having to readvertise for a new award. These delays are unfortunate, damaging and costly, not only to Tacoma but to the nation. **—Everett E. Martin, cost and rate engineering analyst.**

Washington Water Power

Second Biggest Year

More than $33,000,000 have been budgeted by the Washington Water Power Co. for expansion and improvement in 1958 in the utility's eastern Washington-northern Idaho service area.

Biggest item in the 1958 program is a $25,745,000 allocation for the company's Noxon Rapids project in western Montana. Now about 50% completed, the project will deliver first of its 400,000 kw of new electricity in the fall of 1959.

The $33,062,000 program will be the second largest in the utility's 67-year history, exceeded only by the $36,000,000 spent in 1957. Of this amount, nearly $1,700,000 will be spent to complete and equip the utility's five-story general office building now under construction on WWP's new central service facility site on Upriver Drive.

The company is in the third year of a five-year program of expansion and improvement, which will approximately double the firm's investment in plants and equipment by the end of 1960. When WWP's Noxon project comes into full production in 1960, the company will be "nearly self-sufficient" in its ability to provide power to customers from its own generating resources. However, these new power sources will be needed in 1960 to meet increasing rural, residential, commercial and industrial loads.

WWP is a one-fourth partner in the Pacific Northwest Power Co.'s proposal to build a two-dam project on the Snake River, and would have 295,000 kw of new power available from the project upon its completion. Progress on the Mountain Sheep-Pleasant Valley project has been stalled for more than two years, however, by the intervention of public power advocates in PNP's application for a license to construct the $234,000,000 installation.

If it hadn't been for this unwarranted obstruction, there could have been more than a million kilowatts of new electric energy available by 1960 to aid the Northwest's industrial development. **—George Brunzell, vice-president.**

Yakima Project, USBR

Construction of the power house structure of the Roza power plant, placed under contract in January 1956, was essentially completed by the end of the year. In November a contract was awarded for completion of the plant, including installation of the nonembedded parts of the 18,000-hp turbine and other equipment. Fabrication of the plant's single 11,250-kw generating unit has been completed, and installation of the unit was in progress at the end of the year. The plant is expected to be placed on the line in the spring of 1958.

Wyoming

Missouri River Basin Project, USBR

In Wyoming, construction advanced on Glendo and Fremont Canyon power plants, the principal feature of the project's Glendo unit. The contract for the construction of the earthfill, 3,051,000-cu-yd Glendo Dam, on the North Platte River near the town of Glendo, and the foundation for the Glendo power plant was completed in December. The contract for completion of the power plant and switchyard was about 60% completed at the end of the year. A third contract for furnishing and installing the plant's two 12,000-kw generators is also about 60% completed. The power plant is expected to be placed in full operation by the spring of 1958.

Fremont Canyon power plant was placed under construction in June. The plant, near Alcova, Wyo., will have two 24,000-kw generating units, comprising a total installed capacity of 48,000 kw. The contract for furnishing and installing the two units was awarded late in November. The plant is programmed to go on the line in 1960.

Specifications are expected to be issued early in 1958 for the initial phases of the 300-mile-long, single-circuit, 230-kv, steel-tower transmission line to extend from Fort Peck, Mont., through Glendive in the same state to Bismarck, N.D. Among other quantities, this work will require 9,175 tons of steel for the transmission line towers, 13,000 lin ft of wood piles, 16,400 cu yd of concrete, and 820 tons of reinforcing steel.

Hawaii

Hawaiian Electric

Peak Up 11.5%

The year 1957 marked the completion of the second unit in the newly dedicated Leslie A. Hicks power plant near downtown Honolulu.

Tests on this new unit resulted in rating this machine at 60,000 kw, which surpassed the guaranteed capability of 50,000 kw. It is the most efficient unit on the system. The final cost of approximately $6,500,000 is considerably under the original estimate.

The design of a 50,000-kw unit for the Waiau power plant was completed this year. This unit will be the first outdoor unit on our system and is scheduled for operation in mid-1959.

The major transmission and distribution projects for the year centered about the 11-kv system of the city. Capacity between the 44-kv system and this system was increased by the installation of a 33-mva transformer bank at Iwilei substation and a 33-mva transformer bank at School Street substation. This increased 11-kv tie capacity will allow minimum operation of the less efficient generators in the Alakea Street plant.

Approximately 5,300 ft of low pressure gas-filled 44-kv cable was installed from the Leslie A. Hicks power plant 44-kv switchyard to Iwilei substation to carry power to the transmission system. An additional 1.3 miles of new 44-kv line were added to the transmission system, consisting of a line to Waikiki substation and a second 44-kv line to Castner substation at Schofield Barracks, where the Army increased the capacity of their substation by 10,000 kva.

Design of our first 138-kv transmission line, from Waiau to Koolau, was approximately 90% complete at the end of the year. This 11.2-mile line is being designed for an initial installation of 556.5-mcm all-aluminum conductor, with provision for the future installation of another conductor of this size in duplex with it.

Total distribution substation capacity was increased by 30,175 kva. Substations serving the Honolulu Rapid Transit Co. were removed when electric trolley buses were discontinued. A substation of 18,750 kva capacity was constructed at station G to supply power to the Pearl Harbor Naval Shipyard until such

time as a new Puuloa substation is constructed by the Navy and the Hawaiian Electric Co. in the vicinity of the Hickam Field main gate.—**L. W. Lengnick, vice-president and executive engineer.**

Maui Electric

Will Tie in Keanae System in '58

The building of our new 21-mile, 69-kv transmission line to Lahaina was our major accomplishment for 1957. It was built to serve the Pioneer Mill Co. Ltd. with bulk power. In 1958 we plan to construct a 14-mile, 22-kv transmission line from Haiku to Kailua in order to connect our isolated Keanae system to our regular system. This will be done because the present hydro plant serving this isolated system will soon require extensive rebuilding. Other construction for 1958 will be for minor improvements to our system. **—R. R. Lyons, general manager.**

REA

Consumption Doubling Every Seven Years

During 1957, REA made nearly $38,000,000 in loans to rural electrification borrowers in the 11 Western states. This was about $10,000,000 less than approved during the preceding year. Cumulative total loans to borrowers in this area now exceed $460,000,000.

Loans made in 1957 were distributed among the states as follows:

Arizona, $2,464,000; California, $1,237,369; Colorado, $10,970,000; Idaho, $1,324,000; Montana, $6,417,000; New Mexico, $4,093,000; Oregon, $1,711,000; Utah, $5,045,000; Washington, $3,591,000; Wyoming, $912,000. No loans were made in Nevada last year.

These loans will enable the borrowers to serve an estimated 10,000 new rural consumers and add approximately 4,000 miles of new line to their systems.

Rural electric cooperatives, public power districts and other power distributors in the 11 Western states, which are using REA financing, were serving a total of about 349,000 consumers over more than 137,000 miles of line on Oct. 31, 1957.

As of July 1, 1957, 94.5% of the farms in these states had electricity. In most cases this percentage represents an increase over the previous year. In the individual states the

Status of Western REA-Financed Systems

Borrower	Cumulative Construction Loans, 12/31/57	1957 Construction Loans	Miles Energized 10/1/57	Consumers Served 10/1/57
Arizona	**$24,286,369**	**$2,464,000**	**5,234**	**16,648**
Stonewall Elec. Co., Trinidad, Colorado	100,000†		116‡	200‡
San Carlos Irrig. & Drainage Dist., Coolidge	142,286†		117‡	331‡
Navopache Elec. Co-op., Lakeside	4,128,000	880,000	774	3,762
Sulphur Springs Valley Elec. Co-op., Willcox	8,376,828	1,584,000	1,750	6,303
Littlefield Elec. Co-op., Littlefield	20,000		14	23
Graham County Elec. Co-op., Pima	3,032,318		625	2,385
Trico Electric Co-op., Tucson	4,695,368		760	1,121
Verde Electric Co-op., Cottonwood	664,569		219	497
Mohave Electric Co-op., Kingman	975,000		293	524
Duncan Valley Elec. Co-op., Duncan	802,000		255	796
Welton-Mohawk Irrig. & Drainage Dist., Welton‖	1,350,000		311	706
California	**$31,670,547**	**$1,237,369**	**3,539**	**49,592**
Imperial Irrig. Dist., Imperial‖	700,000†		800‡	4,100‡
Surprise Valley Electrification Corp., Alturas	3,088,369	696,869	1,004	2,081
Plumas-Sierra Rural Elec. Co-op., Portola	1,687,000		555	1,295
Mountain Empire Elec. Co-op., Campo	918,500	96,500	227	1,125
Mesa Electric Co-op., Phelan	67,829†		*	*
Klamath River Elec. Co-op., Hornbrook	43,849†		3‡	80‡
Sacramento MUD, Sacramento‖	23,239,000		799‡	40,597‡
Desert Electric Co-op., Twentynine Palms	1,258,000	326,000	*	*
Anza Electric Co-op., Anza	668,000	118,000	151	314
Colorado	**$115,041,739**	**$10,970,000**	**31,696**	**76,706**
Grand Valley Rural Power Lines, Grand Junction	2,233,000		726	3,698
San Luis Valley Rural Elec. Co-op., Monte Vista	4,472,000	208,000	1,319	3,336
Morgan County Rural Elec. Assn., Fort Morgan	7,573,000	1,780,000	2,202	4,638
Intermountain Rural Elec. Assn., Littleton	7,466,500	1,112,000	2,393	7,486
Southeast Colorado Power Assn., La Junta	8,805,234		4,386	5,933
Gunnison County Elec. Assn., Crested Butte	1,089,167	92,000	291	727
Delta-Montrose Rur. Power Lines Assn., Delta	1,742,000		777	2,258
Union Rural Electric Assn., Brighton	4,157,000	1,260,000	1,044	3,956
San Isabel Electric Assn., Pueblo	5,619,741	825,000	1,805	4,875
San Miguel Power Assn., Nucla	3,065,000	409,000	579	2,037
Highline Electric Assn., Holyoke	5,706,510	1,520,000	2,747	4,236
Poudre Valley Rural Elec. Assn., Ft. Collins	3,543,000		1,319	3,876
La Plata Electric Assn., Durango	2,261,000	452,000	732	2,320
Empire Electric Assn., Cortez	3,790,448		816	4,865
Holy Cross Elec. Assn., Glenwood Springs	1,560,000		599	1,776
Sangre De Cristo Elec. Assn., Salida	1,367,000	145,000	479	1,336
Yampa Valley Elec. Assn., Steamboat Springs	4,861,000		1,382	4,598
Mountain View Elec. Assn., Limon	5,790,500		2,783	4,354
Y-W Electric Assn., Akron	4,755,746	922,000	2,201	3,497
K. C. Electric Assn., Hugo	4,295,000		1,958	3,234
White River Elec. Assn., Meeker	2,025,893	245,000	455	1,072
Mountain Parks Electric, Granby	3,240,000		703	2,598
Colorado-Ute Electric Assn., Montrose	12,155,000	2,000,000	*§	*§
Tri-State G & T Assn., Fort Morgan	9,968,000		*§	*§
Arkansas Valley G & T, Pueblo	3,500,000			
Idaho	**$20,780,795**	**$1,324,000**	**6,624**	**16,213**
Northern Lights Inc., Sandpoint	4,678,750		1,242	3,640
Clearwater Power Co., Lewiston	5,517,000		1,941	4,317
Kootenai Rural Elec. Assn., Coeur d' Alene	2,101,000	890,000	563	2,383
Long Valley Power Co-op., Donnelly	196,045†		165‡	420‡
Idaho Co. L & P Co-op. Assn., Grangeville	1,435,500		677	1,221
Raft River Rural Elec. Co-op., Malta	1,882,500		583	956
Fall River Rural Elec. Co-op., Ashton	1,435,000		583	1,461
Lost River Elec. Co-op., Mackay	1,327,000		309	982
Prairie Power Co-op., Fairfield	424,000		245	228
Salmon River Electric Co-op., Challis	1,784,000	434,000	316	655
Montana	**$57,754,032**	**$6,417,000**	**27,971**	**41,731**
Ravalli County Elec. Co-op., Corvallis	947,700	76,000	389	982
Sun River Elec. Co-op., Fairfield	3,029,500	610,000	1,868	2,468
Lower Yellowstone Rural Elec. Assn., Sidney	1,861,600		1,109	1,581
Yellowstone Valley Elec. Co-op., Huntley	2,025,498		1,022	2,563
Vigilante Electric Co-op., Dillon	3,513,000		1,369	2,025
Missoula Elec. Co-op., Missoula	1,912,000		593	1,281
Flathead Electric Co-op., Kalispell	3,500,000	755,000	750	2,299
Fergus Electric Co-op., Lewistown	3,271,354		2,410	2,740
Park Elec. Co-op., Livingston	1,545,000		715	1,207
Mid-Yellowstone Elec. Co-op., Hysham	937,000		579	932
Beartooth Elec. Co-op., Red Lodge	1,235,982		1,014	1,814
Big Horn County Elec. Co-op., Lodge Grass	1,971,000	204,000	744	1,420
Big Flat Electric Co-op., Malta	2,077,000	478,000	1,005	905
Sheridan County Elec. Co-op., Medicine Lake	4,241,000	1,526,000	1,977	2,084
Northern Electric Co-op., Opheim	2,792,000	874,000	1,065	1,040
Valley County Elec. Co-op., Glasgow	1,254,000		657	904
McCone Electric Co-op., Circle	4,922,398	770,000	2,639	2,879
Goldenwest Elec. Co-op., Wibaux	1,139,000		745	731
Glacier County Elec. Co-op., Cut Bank	2,886,000		1,061	3,393
Marias River Elec. Co-op., Shelby	2,269,000	358,000	1,064	2,765
Hill County Elec. Co-op., Havre	3,738,000	403,000	2,484	1,871
Tongue River Elec. Co-op., Ashland	2,762,000		1,215	1,430
Southeast Elec. Co-op., Ekalaka	2,064,000	363,000	1,129	1,130
Elmo Electric Cooperative, Proctor	220,000		48‡	162‡
Lincoln Electric Cooperative, Eureka	1,640,000		320	1,125
Nevada	**$ 352,703**	**$**	**165**	**746**
Alama Power Dist. No. 3, Alamo‖	99,000		36	95
Overton Power Dist. No. 5, Overton‖	253,703		129	651

* Not Energized † Loan Repaid ‡ Estimate § Power-Type Borrower ‖ Public Agency

(*Continued on page 94*)

Status of Western REA-Financed Systems

(Continued from page 93)

Borrower	Cumulative Construction Loans, 12/31/57	1957 Construction Loans	Miles Energized 10/1/57	Consumers Served 10/1/57
New Mexico	**$75,793,499**	**$4,093,000**	**20,176**	**50,814**
Central Valley Elec. Co-op., Artesia	5,638,000	1,084,000	1,279	3,642
Roosevelt County Elec. Co-op., Portales	3,929,000	785,000	1,475	2,795
Farmers' Elec. Co-op., Clovis	5,036,000	.....	2,571	4,834
Kit Carson Elec. Co-op., Taos	3,042,215	.....	756	5,096
Otero County Elec. Co-op., Cloudcroft	3,382,183	.....	1,220	3,236
Stonewall Electric Co., Albuquerque	134,498†	.....	119‡	489‡
Mora-San Miguel Elec. Co-op., Mora	1,483,000	.....	742	1,977
Northern Rio Arriba Elec. Co-op., Chama	1,261,800	.....	306	1,206
Sierra Elec. Co-op., Truth or Consequences	928,000	330,000	305	547
Plains Elec. G & T Co-op., Albuquerque	14,304,341	1,053,000	183§	§
Springer Elec. Co-op., Springer	3,478,000	.....	1,351	2,218
Socorro Elec. Co-op., Socorro	4,482,990	616,000	1,157	3,355
Central New Mexico Elec. Co-op., Mountainair	4,478,500	75,000	2,289	3,080
Continental Divide Elec. Co-op., Grants	4,042,069	.....	1,023	4,158
Lea County Elec. Co-op., Lovington	10,408,000	.....	2,149	6,423
Columbus Elec. Co-op., Deming	3,715,000	.....	1,012	919
Southwestern Elec. Co-op., Clayton	1,560,000	150,000	1,230	866
Jemez Mountains Elec. Co-op., Espanola	4,489,903	.....	1,009	5,973
Oregon	**$42,709,833**	**$1,711,000**	**10,451**	**33,192**
Blachly-Lane Co. Co-op. Elec. Assn., Eugene	1,782,000	480,000	303	1,207
Consumers Power Inc., Corvallis	7,370,000	.....	1,467	5,062
Umatilla Elec. Co-op. Assn., Hermiston	1,443,000	.....	480	1,814
Malheur Co-op. Elec. Assn., Vale	463,670†	.....	365‡	621‡
Douglas Elec. Co-op., Roseburg	3,284,674	.....	873	3,530
Lane County Elec. Co-op., Eugene	3,681,426	.....	766	5,049
Jordan Valley Elec. Co-op., Jordan Valley	27,584†	.....	41	91‡
Coos-Curry Elec. Co-op., Coquille	6,894,604	702,000	790	5,295
Sandy Electric Co-op., Sandy	995,875†	.....	222‡	884‡
Tillamook People's Utility District, Tillamook‖	425,000	.....	70	411
Central Elec. Co-op., Redmond	2,207,000	.....	844	1,964
Wasco Elec. Co-op., The Dalles	2,590,000	.....	1,177	1,614
Columbia Basin Elec. Co-op., Heppner	2,290,000	.....	908	772
West Oregon Elec. Co-op., Vernonia	2,396,000	.....	458	2,112
Eastern Oregon Elec. Co-op., Pendleton	945,000	150,000	247	697
Columbia Power Cooperative Assn., Monument	2,385,000	.....	641	1,081
Midstate Elec. Co-op., La Pine	2,040,000	.....	559	887
Harney Elec. Co-op., Burns	1,489,000	379,000	267	101
Utah	**$14,864,906**	**$5,045,000**	**1,743**	**4,450**
Garkane Power Assn., Richfield	3,549,500	310,000	559	1,616
Moon Lake Elec. Assn., Vernal	10,392,000	4,246,000	991	2,424
Beaver Valley Rural Elec. Assn., Beaver City	14,606†	.....	131	45‡
Escalante Valley Elec. Assn., Beryl	322,800	.....	109	253
Flowell Elec. Assn., Fillmore	523,000	489,000	37‡	76‡
Dixie Rural Elec. Assn., St. George	63,000	.....	34‡	36‡
Washington	**$43,132,008**	**$3,591,000**	**14,326**	**36,412**
Benton Rural Elec. Assn., Prosser	4,791,500	897,000	1,224	3,721
Orcas P. & L. Co., Eastsound	2,712,600	310,000	327	1,523
Mutual P. & L. Assn. of Tanner, North Bend	224,219	.....	42	186
PUD No. 1, Klickitat Co., Goldendale‖	3,794,000	644,000	899‡	2,303‡
Inland P. & L. Co., Spokane	7,169,710	.....	3,685	7,885
Columbia Rural Elec. Assn., Dayton	2,137,000	500,000	839	1,319
Quinault Light Co., Quinault	763,000	.....	56	325
PUD No. 1, Cowlitz Co., Longview‖	201,192†	.....	185‡	680‡
PUD No. 1, Lewis Co., Chehalis‖	467,751†	.....	330‡	1,817‡
PUD No. 1, Kittitas Co., Ellensburg‖	520,500	.....	241	563
Stevens County Elec. Co-op., Colville	2,243,996†	.....	1,060‡	2,280‡
Chelan County Elec. Co-op., Leavenworth	253,091†	.....	101‡	364‡
Okanogan County Elec. Co-op., Winthrop	390,000	.....	139	553
Big Bend Elec. Co-op., Ritzville	5,392,000	1,240,000	1,606	2,165
Lincoln Elec. Co-op., Davenport	2,137,000	.....	1,179	1,143
Nespelem Valley Elec. Co-op., Nespelem	646,000	.....	246	519
Molson-Chesaw Elec. Co-op., Molson	315,000	.....	130	162
PUD No. 1, Clallam Co., Port Angeles‖	418,213†	.....	75‡	930‡
PUD No. 2, of Grant Co., Ephrata‖	49,280†	.....	24‡	743‡
PUD No. 1, Ferry Co., Republic‖	2,440,000	.....	811	1,187
PUD No. 1, Douglas Co., Bridgeport‖	5,622,000	.....	1,018	5,420
PUD No. 1, of Mason County., Shelton‖	230,000	.....	50	126
PUD No. 1, Pend Oreille Co., Newport‖	213,956†	.....	59‡	498‡
Wyoming	**$34,043,217**	**$912,000**	**14,813**	**22,533**
Riverton Valley Elec. Assn., Riverton	2,110,000	.....	1,178	1,833
Big Horn Rural Elec. Co., Basin	1,935,000	.....	826	1,673
Wyrulec Co., Lingle	2,381,600	.....	1,134	2,185
Bridger Valley Elec. Assn., Mountain View	1,397,800	.....	447	874
Wheatland Rural Elec. Assn., Wheatland	2,118,000	532,000	1,045	1,128
Lower Valley P. & L., Afton	4,206,006	.....	906	3,065
Garland L. & P. Co., Powell	435,300	.....	199	505
Washakie Rural Elec. Co., Worland	316,500	.....	93	303
Rural Elec. Co., Pine Bluffs	4,014,510	.....	2,330	3,332
Hot Springs Co. Rural Elec. Assn., Thermopolis	2,454,000	39,000	735	724
Carbon P. & L, Saratoga	2,120,055	48,000	988	1,698
Niobrara Elec. Assn., Lusk	2,626,000	250,000	1,466	1,310
Shoshone River Power Co., Cody	1,365,000	.....	400	536
Sheridan-Johnson Rural Elec. Assn., Sheridan	1,528,000	43,000	781	872
Tri-County Elec. Assn., Sundance	4,956,746	.....	2,120	2,267
Sheridan Suburban Elec. Co., Sheridan	78,700†	.....	165‡	228‡

* Not Energized
† Loan Repaid
‡ Estimate
§ Power-Type Borrower
‖ Public Agency

per cent of electrified farms was estimated as follows:

Arizona, 88.5%; California, 96.9%; Colorado, 89.1%; Idaho, 96.9%; Montana, 87.1%; Nevada, 77%; New Mexico, 83.5%; Oregon, 97.3%; Utah, 98.1%; Washington, 98.7%; Wyoming, 87.7%.

Power consumption on lines financed by REA is doubling every seven years. In the Western states, as throughout other sectors of the country, power suppliers continued to pay special attention to system improvements to meet this increasing demand. Two loans for new generation and transmission facilities were made during the year in the Western states: $2,000,000 to the Colorado-Ute Electric Assn. in Colorado; and $1,056,000 to the Plains Electric Generation and Transmission Cooperative, New Mexico.

Canada

B. C. Electric

Energy Output Up 17%

The output of electrical energy for the B. C. Electric system, comprising the mainland and Vancouver Island areas, increased by 17% during 1957 as compared with 1956. As a result of a strike in the pulp and paper industry during December and part of November, the system peak output of 668,000 kw was only slightly greater than the peak load during the 1956-57 winter.

To provide for new and improved facilities, expenditures on electric plant amounted to more than $80,000,000. The generating program provided for completion of three hydro plants, Cheakamus, Clowhom and LaJoie, as well as continued construction on the Port Mann gas turbine plant and the second and final stage of Bridge River.

The Cheakamus plant comprising two 70,000-kw generating units and completed in December is believed to be the largest remotely controlled hydro plant in existence. The output of this plant is connected to the company's transmission system by a 230-kv transmission line. The approximate cost of this development was $25,000,000.

At year's end the company's Clowhom 30,000-w automatic hydroelectric plant was within days of going into service. The output of this generating station will be connected to the company's 132-kv transmission system by an existing 22-mile line along the shoreline of the Inlet.

During 1957 a second transmission line from Bridge River was placed

in service. This second line, connected to the previously constructed line serving the Wahleach plant, has been operating since August last at 345 kv. At the Vancouver end, this line terminates at Ingledow substation where a 450-mva bank of autotransformers has been placed in service, stepping down to 230 kv, together with a shunt reactor installation comprised of two 37.5-mvar units to provide reactive compensation for the line.

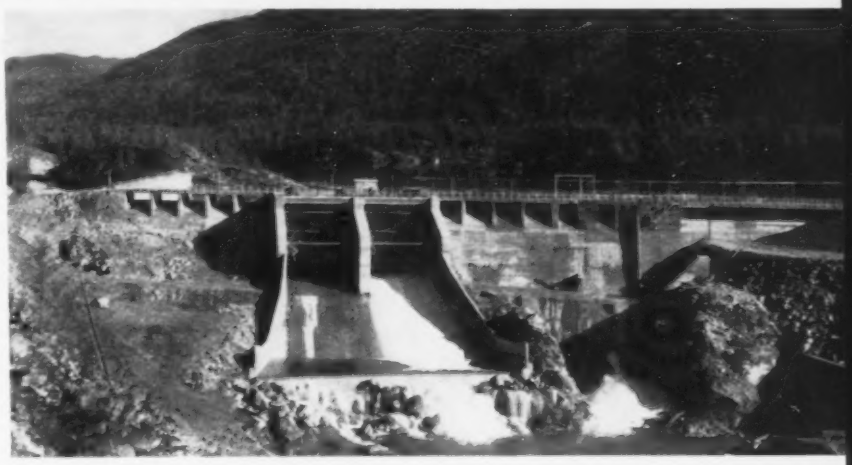
Construction is proceeding on the 100,000-kw Port Mann gas turbine generating station, which is scheduled for completion in the summer of 1958. This generating station, designed to be remotely controlled from the company's load dispatch office, will consist of four 25,000-kw generators driven by four 3,000-rpm gas turbines.

In 1956 the mainland and Vancouver Island systems were interconnected by means of a 132-kv line, partly overhead and partly submarine. The submarine portions consist of two lengths totaling 19.6 circuit miles. The longer length, crossing the Gulf of Georgia, involves a length of 16.5 miles without field splices. Plans are in hand to lay additional cables in 1958 to complete a second circuit giving a total capacity of 240 mva.

Plans for 1958 include construction of substations at Coquitlam, Annacis Island, White Rock, Horseshoe Bay and other points on the mainland. On Vancouver Island a new major substation named E. N. Horsey will be built in Victoria to serve the central city area including a partially constructed underground network.

Immediately following the move to the company's new head office building early in 1957, a new load dispatch and supervisory control center was established in the new building together with an adjoining trouble center for dealing with gas and electricity service matters. From the supervisory control center, four generating plants and 18 major substations are directly controlled and alarm and reset facilities are provided for a number of smaller stations.

For 1958 the budget for new construction and additional electrical facilities is $81,500,000. Included in this budget are funds to cover supply of equipment and initial stages of construction for a steam plant at Ioco in the Vancouver area. This plant is being designed for an ultimate installation of six 157.5-mw units. The first two units of this plant are planned for operation in 1961 and two additional units are on order for later installation.—**J. H. Steede, chief engineer, electrical division.**



Georgia generating station (above) on Vancouver will be the world's largest gas turbine station, 100 mw when in full operation late in 1958. (Below) B. C. Electric's Cheakamus Plant Dam. The 70-mw electric plant is remotely controlled

B. C. Power Commission

'58 *Peak Down From* '57

1957 Accomplishments—During the year the following generating stations were placed in service:

1. Georgia generating station, gas turbine ..... 92,000 kw
2. Ladore Falls generating station, hydro ..... 54,000 kw
3. Prince George, Dawson Creek and Quesnel generating stations, diesel, totaling ..... 29,600 kw

A total of 330,500 kva of transformer capacity was commissioned on the transmission systems during 1957. The distribution system commissioned a total of 37,750 kva of transformer capacity during the year.

1957 was a record year for the commission in construction of transmission lines. Of the 264 miles constructed, approximately 100 miles were 138 kv, including approximately three miles of double-circuit steel towers, the remainder being H-frame, truss-arm and spar-arm construction. The remaining 164 miles were 63-kv pin-type lines in several separate projects in central and northeast British Columbia.

Distribution construction during 1957 continued at an average rate and the same is expected for 1958.

Proposed 1958 Construction Program—The following generation program is scheduled for 1958:

1. Initial work on the Kokish River project will commence in the fall of 1958.
2. Upper Campbell generating station, hydro, to produce 34,000 kw, is expected to be in service early in 1958.
3. Ash River generating station, hydro, to produce 25,000 kw, is expected to be in service during the latter part of 1958.

It is anticipated that a total of 83,250 kva of transformer capacity will be commissioned on the transmission systems during 1958.

Also, a total of 600 kva of transformer capacity will be commissioned on the distribution systems during 1958.

The 1958 transmission line program will be very light in comparison with 1957. Distribution line construction will be approximately the same. Most of the materials required for 1958 are presently on order or in hand.—**James M. Bogyo, public information officer.**

Problems of Management — II

How to Sell Your Ideas to the Boss

Joseph G. Phelan, Ph.D., Industrial Psychologist, Bechtel Corp.

Management all too often rejects "hot ideas" developed by people in the organization. This is usually because of the way the idea is presented; because there is often a vast difference in the point of view between top management and department heads. This difference involves the problem and thinking patterns of people at the top.

Remember the top management man improves his position only by protecting and improving the profit position of the organization. He is faced with the fear of loss. When large investments are required and when there are a great many unknowns in a new idea, the tendency is to play it safe. On the other hand, new ideas are the very essence of growth and progress. Therefore, when good ones arise, it is imperative that they be presented in the most factual and thoughtful way possible. The application of a few simple rules will insure that a good idea gets the most attentive hearing and thoughtful consideration at the higher echelons in management.

Rule 1: **Organize your presentation.** Don't go in to the boss with half-baked ideas. Analyze your plan in relation to the objectives of company policy and plan your presentation so that you can interpret it in terms that will be understood by your 12-year-old son. If you cannot do this, you probably are not too clear on the idea yourself.

Rule 2: **Relate your idea to its value in the organization.** Ask yourself this question, "why would the owners of this business take X number of dollars and gamble them on this plan, rather than put the same amount of money into some other use?" Before an idea is adopted by top management, someone is going to prepare a profit and loss statement on the idea projected for at least five years ahead. It might as well be you because such a statement will be important in "selling" the idea higher up.

Rule 3: **Beware of false assumptions.** Top management has indicated to survey reporters that the most frequent reason for the rejection of ideas is the presence of a defect in the logic of the idea as presented. Some men with the best ideas show almost a total ignorance of some of the important variables which must be considered in an overall appraisal of a new course of business action. All too often, sound projects are rejected because of a lack of supporting data or by faulty reasoning incorporated in their presentation.

Rule 4: **Don't gild the lily.** Avoid exaggeration or overstatement. Be conservative in estimates of the beneficial results and do not underestimate the difficulties or costs that would probably be incurred. Realistic businessmen tend to lose their confidence in a too brightly painted picture.

Rule 5: **Point up potential weak spots.** List the assumptions made and catalog those which can be verified, partly verified or which require further investigation. Suggest ways and means that the weaker points could be firmed up through other departments or outside analysis.

Rule 6: **Include a discussion on related advantages.** Most ideas are suggested for the improvement in operation of an individual department. Many times the idea can affect the operation of other departments or of the entire organization either favorably or unfavorably. Ask yourself what effects the adoption of this idea might have on other departments, community relations, company prestige and other phases of the business success. Top management is going to ask those questions. It's best to be prepared with answers.

Rule 7: **Is your timing right?** Internal and external circumstances may make the best idea impractical at any given time. It would be folly to suggest an idea that would require a large investment at a time when the company was finding it difficult to obtain funds. It may be that your immediate superior is close to retirement and is not particularly interested in biting off a big chunk of new responsibilities. Many good ideas lie forgotten in file cabinets because top management decided "the time is not quite ripe now." Use your knowledge of general business conditions and the situation within your own organization to spring your ideas when management is liable to be most receptive.

Rule 8: **Keep it simple.** Management is bright. It can get an idea without bugle blowing, gimmicks and elaborate visual aids. In fact, it sometimes is antagonized by these devices. Clear, simple logic, backed by facts that are marshalled to lead the listener to your conclusions and recommendations, is most persuasive.

Rule 9: **Set the stage properly.** Don't present a good idea casually or as part of another conversation. Be sure the boss will have time to hear you out once you start a presentation. Try to make an appointment and, if desirable, suggest that two or three other executives who might be interested be present. If the idea is big enough and important enough, it is better to present it in a conference room where the listeners will be relatively free from routine interruptions by telephone, etc.

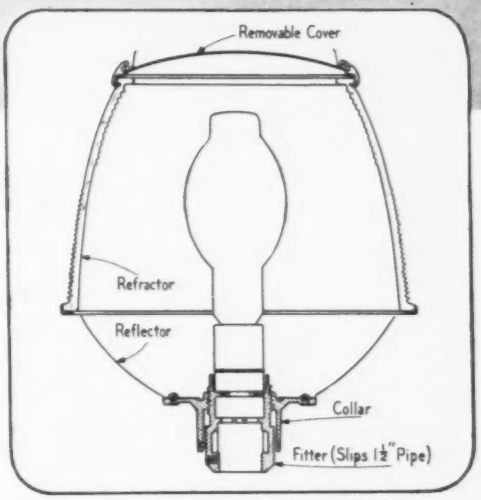
There's more to communications than mere conversation. Opening the communication channels and keeping them open is part of every manager's job and one of the surest ways of moving ahead.

Check Your Score on the Management Test, page 12

Score yourself on this test by counting one point for each true response and zero for each false response. The perfect score is zero.

Developed by HOLOPHANE Research and "Know-How"...

◂ The Newest Luminaire *Specially Designed for* OUTDOOR SUBSTATIONS



Behind this new luminaire are the concentrated experience and specialized knowledge accumulated through 35 years of Holophane leadership in outdoor substation lighting . . . Totally new in design and performance — this is the only luminaire in the field to offer all these advantages:

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Domestic load is vital to continued industry prosperity, Western executives believe. It. is slow, tedious and costly to build but . . .

Industry Teamwork Can Do the Job

THAT the domestic load building program needs strengthening in areas of the West and that industry teamwork can do the job was the consensus of replies to an ELECTRICAL WEST survey of a small but representative group of utility executives, manufacturers and distributors.

Fact that in 1957 the rate of domestic kwh growth in the West for the first time fell below the national average caused concern to all branches of the industry and brought a request for this poll on partnership load building.

To the question: "Is there need for closer teamwork between power company, manufacturer-distributor, contractor and dealer to speed growth in domestic use of electric service and equipment," the majority answered an unequivocal "yes." No utility executive said "no," though a few did not answer the question.

"No" answers among the manufacturers and distributors were in areas with strong electrical bureaus or leagues, where program coordination has proved that teamwork pays. Even in those areas the utility spokesmen thought more could be done with 100% participation.

There was no attempt to deny the importance of domestic load growth to the electrical industry's continued prosperity. As one executive put it, "When kwh growth falls off, so does the utility's ability to raise money for plant expansion." Others pointed out that electric power stations are built on long-lead time and that domestic load, slow and costly to get, holds relatively steady in good times and bad.

Manpower and money are essentials to an effective promotion program and industry teamwork can stretch both, it was pointed out. Utilities are spending a lot of money, one distributor said, but it is only 50% effective without cooperation between their people and those at the point of sale.

How to get the job done

Utilities and manufacturers agree that, for a really effective sales job, all branches of the industry must sit around the table during the planning sessions. The existing framework of league or bureau is well accepted. But while the industry points with pride to the successful associations, it wants to see similar groups functioning in all areas.

Utilities were almost unanimous in accepting responsibility for leadership in coordinating promotional campaigns but they want full support from manufacturers on the local level. They want the manufacturers and distributors to contribute ideas, manpower and money.

While the nature of the survey put the emphasis on reporting areas for improvement, answers were constructive, not critical. Warm appreciation was expressed by each group for the help of the other. The utilities acknowledge that the manufacturers generally produce a quality product relatively free from service problems and at a fair price. The manufacturers and distributors are well aware of the preselling job being done by the utilities through their public education programs. They know that public acceptance of new products and continued use of existing appliances is increased by utility home economists and contact people. Each group is now getting many of the helps it wants from the other. Here are a few suggestions for strengthening the cooperative program:

Utilities want these things

Better communication was the No. 1 need cited by utility men. They would like to see the lines strengthened between the four selling branches of the industry and within organizations, from the boss down to the salesman on the floor.

More aggressive follow-through with dealers by distributors is a definite need, according to the utilities. Here are others:

Better arrangements for guaranteeing and servicing equipment sold to customers.

A definite date for introducing new products, with full assurance that a supply will show up in time for scheduled promotions.

Better product information and notice of price changes.

Within some utility organizations there is a feeling that manufacturers should **tailor their campaigns to the local situation** and make available equipment and appliances that are desirable utility loads from the standpoint of rates and load factor in that particular area.

While utilities generally have been the leaders in educating the public through displays and demonstrations, there was a suggestion that **manufacturers might play a bigger part in model home promotions.** Said one utility executive: "There is a definite need for the manufacturer-distributor to assist in the home service demonstration activities for builders and dealers. Frequently the model home activities of speculative builders do not receive adequate assistance in demonstrating and displaying their new kitchen and laundry installations."

Manufacturers want . . .

Manufacturers would like to see **continued emphasis on adequate wiring,** particularly 100-amp service. One spokesman suggested that utilities should train contractors to sell the Housepower program and assist in promoting the program to the public. They also want from the utilities:

Continued service as an information bureau for the consumer, with displays, rate information, home data, etc.

A clear-cut statement of the loads utilities want on their lines, with, perhaps, a reappraisal of appliances worth promoting from a utility standpoint.

One manufacturer said he believed greater teamwork could be secured "first by a utility stating its policy clearly and precisely without hedging or double talking regarding its desire and appreciation for (1) electric range load; (2) electric water heating load; (3) all-electric heating

load; (4) dryers, etc. This then should be explained to all of their employees, especially those who contact the public, and not just limited to their sales department. Their employees have a long negative stretch to overcome and reeducation will not take too quickly. After this policy is formulated for a clear-cut presentation, meetings should be held with the various branches of the industry that have an interest in load-building appliances."

Advertising picture

Although high praise was given the manufacturers for their national advertising, a better job could be done at the local level, many think. Some utilities would like to see greater support to dealers with cooperative advertising, especially during sales campaigns, and better local saturation at time of product introductions.

A manufacturer suggests that, within the framework of present associations, utilities give more direct advertising support to specific group product ads and run less institutional copy.

Training programs

In some areas utilities feel that manufacturers and distributors do not have enough technical personnel locally to sell items on which public acceptance must be built, such as the heat pump. They think that considerable effort could be expended on an educational program.

One spokesman would like to make the utility responsible for dealer training. "It seems to me," he said, "it would be possible for the utilities to set up and train salesmen for the electric dealers throughout their systems. For instance, the utility could maintain a continuing school at its headquarters to which the dealer could send his newly hired salesman or, occasionally, his regular salesman who might need more training. The utility should certainly bear all costs of this school and might even advance board and room expenses for salesmen during the school. Emphasis should be not only on salesmanship but also on the pioneering of those electric appliances to which the utility must look for its growth."

What they are doing

Some utilities reported plans for strengthening their programs.

Southern Nevada Power Co. is pushing an organization of appliance dealers and is cooperating with the builders' organization in this.

In Phoenix recent formation of an electric club had as its objective a closer association between manufacturer, distributor, contractor and dealer. People in that area felt that teamwork among trade allies was good but could be better.

Washington Water Power plans to sit down with distributors and dealers in each community in order to learn what specifically can be done to stimulate local sales. While consideration will be given to local needs, the utility naturally will be inclined to offer most of its advertising budget and sales manpower along lines that promise new utility revenues, which are needed. Both manufacturer and distributor will be asked to help bear the cost of promotion and will get a tailor-made campaign with carefully estimated results suited to local potential.

This type of local cooperation is entirely practical. In 1957 WWP launched a house heating campaign to bring new revenues. Manufacturers, distributors and dealers gave exceptional cooperation. The quota of 500 new house heating jobs scheduled for the year was reached before the end of July.

Further evidence that teamwork pays can be found in San Diego, where the bureau recently celebrated its 25th anniversary, and in northern California, where bureau promotion reversed the national trend in appliance sales (EWest, January, p. 9).

What they said

Following are a few individual comments. Because some of the spokesmen wanted their names withheld, all are quote anonymously.

A leading West Coast manufacturer of electric equipment: "Since 1940 there hasn't been any load-building effort; the war, periods of shortages, Korea and an abnormal population growth with mass building apparently satisfied the then existing appetite for load, made easy by large industrial growth. . . . History proves that the domestic load is more reliable through the valleys than either the industrial or commercial load. . . . We have been pulling a big oar very much alone, except for the consumer . . ."

A former executive with an appliance distributing organization: "Would not this year, 1958, (or certainly 1959 or 1960) be the time for the manufacturers, wholesalers, dealers and utilities to combine on increasing home liveability in two areas: (1) lighting, both inside and outside the home; (2) temperature comfort, both heating and cooling?

"Perhaps the industry could organize and put behind these two activities not only advertising and promotional aids but specially trained sales people in each field to go from place to place in the territory on a specialty sales basis. In addition to the regular compensation that the retailer could give this special sales force, why not finance them from a pool made up of one-half of one year's utility revenue from the projected new load and one-half of the manufacturers' gross profit on equipment sold.

"This may sound radical but, if such a push can put the use of the equipment substantially ahead, then experience shows that both manufacturer and utility will get plus sales. Such an activity might be heavily financed for one year, less heavily for the second and third years, then tapered off to place both utility and suppliers in a position to command a better part of the consumer's dollar for many years to come."

A distributor: "Utilities once thought that the big load-building appliances were the only ones worth promoting. Now it has been shown that promotional work on other nonsaturated items can bring dividends in new load. The dishwasher, for instance, can be a good place for promotional money. Another new appliance that utility sales management might take a look at is the combination washer-dryer."

Utility executives:

"It would be helpful if manufacturers' representatives would contact utilities when calling on their distributors to familiarize themselves with the existing promotional programs and offer suggestions. . ."

"There is room for improvement in lines of communication within the industry. Promotional campaigns sometimes fail to deliver their maximum results because the man at point of sale (the dealer or his salesman) does not understand the promotion. Sometimes he does not even know about it. Sometimes even the distributor salesman does not know about it, though his employer may have invested a substantial amount of money in it."

"Better teamwork is needed in the contractor and dealer category. Manufacturer-distributor and utility are now together. Dealers need to use the 'find a friend' system among electrical contractors and develop a method whereby an installed price can be quoted on the occasion of the customer's first call."

Along today's modern highways easy-to-handle J-M Transite Ducts provide installation economies and years of service life, protecting traffic-signal, lighting, and other power-service circuits.

J-M Transite® Ducts install fast to last... give complete cable protection.

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For speed, Johns-Manville Transite Ducts are strong, light and long—easy to handle and install. Workmen set 10-foot lengths in place easily, join them up tight in seconds with snug-fitting J-M Plastic Couplings, and Transite's smooth bore is free of burrs and other obstructions that may interfere or cause damage during pulling of cables.

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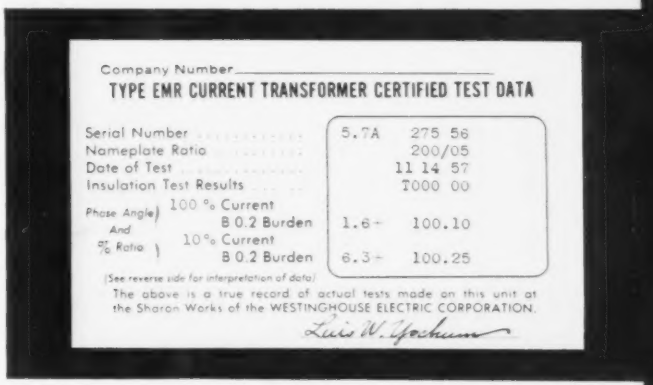
You receive for your files a 3 x 5 file card with the specific test data on every molded current transformer you purchase. This, again, eliminates another step for you when you buy Westinghouse molded current transformers.

These Certified Test Results should satisfy your state PUC requirements.



Company Number_____

TYPE EMR CURRENT TRANSFORMER CERTIFIED TEST DATA

Serial Number		5.7A	275 58
Nameplate Ratio			200/05
Date of Test			11 14 57
Insulation Test Results			T000 00
Phase Angle And % Ratio	100 % Current B 0.2 Burden	1.6+	100.10
	10 % Current B 0.2 Burden	6.3+	100.25

(See reverse side for interpretation of data)

The above is a true record of actual tests made on this unit at the Sharon Works of the WESTINGHOUSE ELECTRIC CORPORATION.

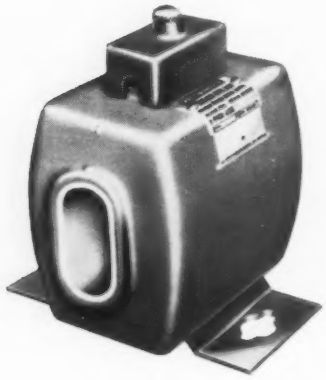
Louis W. Yochum

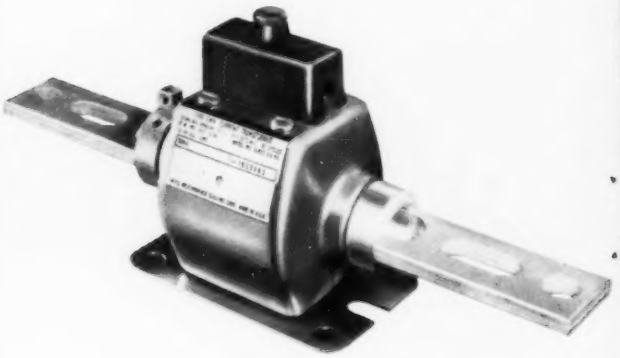
Molded current transformers being tested on the new Westinghouse automatic test installation at Sharon, Pennsylvania. Here is another example of Westinghouse plowing back earnings into development . . . saving you time and money by eliminating testing.

YOU CAN BE SURE...IF IT'S Westinghouse

THEY ALL HAVE IT . . .

All Westinghouse molded current transformers carry the Certified Test Results record. This includes the SM line, molded of silicone rubber, and the 600-volt class, molded of polyester elastomer, a product of Westinghouse research.





The EMO and EMR 600-volt class transformers are four ways superior to any comparable units:

- 50% greater cable capacity—with obround primary opening on the EMO.
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REMEMBER . . .

- You eliminate all testing of these transformers when you buy Westinghouse.
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- You install—that's all—when you purchase Westinghouse molded current transformers.
- You receive . . . on the EMO and EMR current transformers . . . four extra features of superiority.

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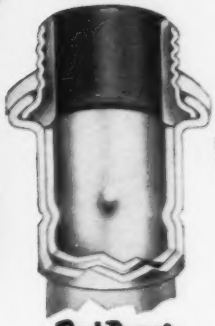
Red Throat
Insulated Connector



Red Throat
Cross section

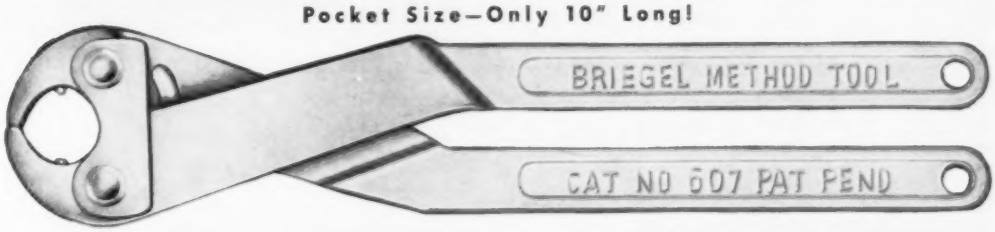
"BM" #100
Cutter for ½, ¾ and 1" E.M.T.

"BM" #1000
Holder for ½, ¾ and 1" E.M.T.

"BM" #600
Changeable Jaw Indenter

THE NEW BM607 INDENTER FOR ½" FITTINGS

Pocket Size—Only 10" Long!



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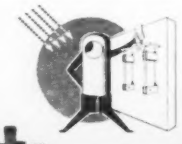

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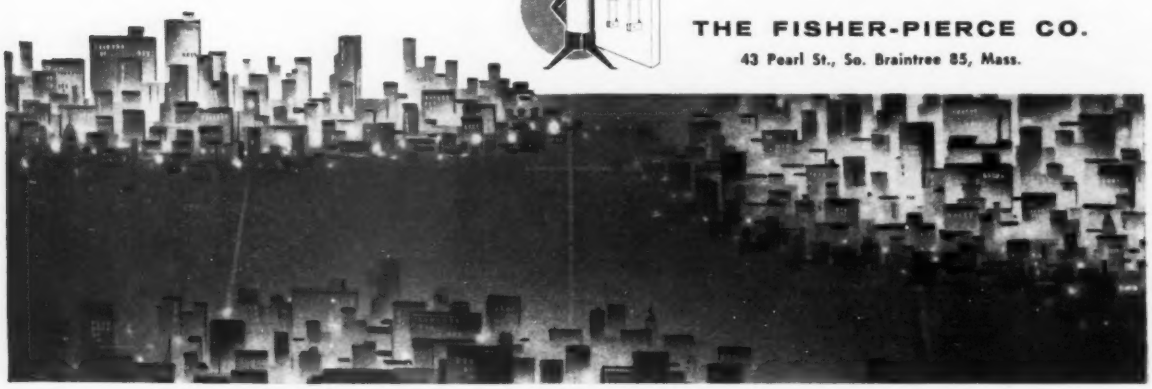

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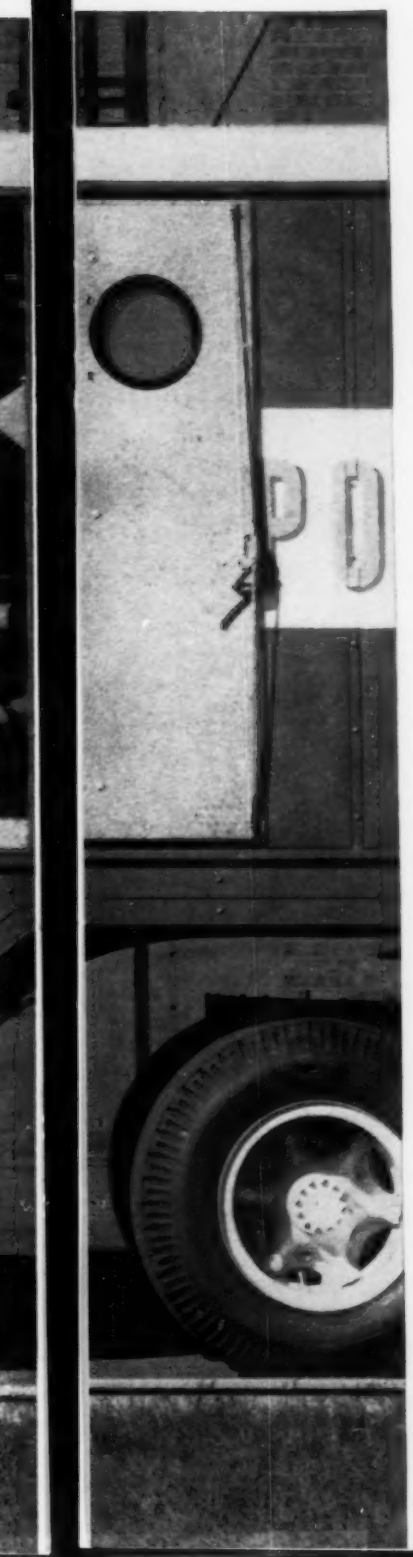
New Copperweld TRADE MARK
TYPE M GUY STRAND

2.2M 4M 6M 8M 10M 12.5M 16M

Built only to

produce electric power



The Diesel engine was first designed and built for mechanical drive. It was much later that Electro-Motive incorporated this principle in designing and building a prime mover specifically for electric power generation.

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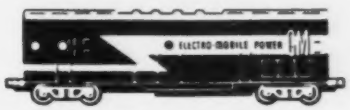
Refined and improved over the years, this advanced prime mover has been produced in quantity by Electro-Motive—enough, in fact, for a total generating capacity of more than 24,000,000 kw. Above all, this engine has proved its dependability, operating for thousands of hours under every conceivable condition with only the most routine type of servicing.

It is this wealth of tested and proven experience that is your best assurance when you install Electro-Mobile equipment. Why not discuss its potential for low load factor generation with your Electro-Motive representative?



1000 kw units for use on sidings or placed on piers for semi-permanent use.

500 kw units offer excellent mobility for many temporary applications.

LIVE BETTER ELECTRICALLY

ELECTRO-MOTIVE DIVISION
GENERAL MOTORS
LA GRANGE, ILLINOIS
Sales offices in Chicago, New York, St. Louis, San Francisco
In Canada: General Motors Diesel Limited, London, Ontario

news

Planning the Pacific Northwest Industrial Electric Exposition to be in Seattle, Feb. 14-16, is the executive committee of Puget Sound Electric League Inc. (formerly Seattle Electric Club). Around the table, left to right: Robert Thompson, Organization Service Bureau, exposition manager; Jim Hartwig, North Coast Electric Co., exhibits; David E. Edwards, Seattle City Light, secretary; Robert L. Lemman, Line Material Industries, general chairman; Howard E. Bayley, Industrial Electric Co., finance; A. J. Flechsig, Westinghouse Electric Supply Co., minutes and records; G. Al O'Brien, Phe'ps Corp., industrial relations chairman; Ralph Neilson, attendance; W. C. Schafer, Crouse-Hinds Co., publicity; and John M. Daniel, Square D Co., manager's aide

(See Associations)

Views of some of the exhibits at the 1957 annual construction show sponsored by the Electrical Contractors' Division, Bureau of Home Appliances of San Diego County

(See Contractors)

The world's longest fish ladder is nearing completion at Portland General Electric's Pelton project on Oregon's Deschutes River. This view shows a portion of it—as it starts its serpentine way up the Deschutes Canyon walls. Width of ladder is 10 ft, with gradient for steepest part 1 ft in each 16½ ft. Fish ladder, 2.7 miles long, will by-pass fish around reregulating dam and main dam. Fish will be further protected by ski-jump spillway. Pelton is scheduled for completion in mid-1958. Guy F. Atkinson Co. is building the project

W. A. Huckins (second from left) receives IEA Life Membership from Vern Sharp. Looking on are Jacob A. Kahn, first president, and DeLamar Holt, 1957 president

(See Market Development)

EW

Management

Upper Columbia Controversy

Canada's plan to divert the waters of the Columbia River in Canada into the Fraser River came in for revived discussions last month. Gen. A. G. L. McNaughton, chairman of the Canadian section of the International Joint Commission, told the House of Commons external affairs committee in Ottawa that harnessing the Fraser River is the only way to provide cheap power to British Columbia. Diversion of flood waters of the Columbia and the Kootenay in Canada to the Fraser could be expected to provide some 17 billion kwh annually at minimum rates.

The alternative to putting the Fraser River to work would be the development of the Columbia by U. S. and Canadian interests which, according to the general, would yield Canada less than half of the potential returns of the Fraser River plan.

Not all Canadians are in favor of the development of the Fraser. Vociferous protests to damming the stream come from the salmon industry. Still other groups think that the Wenner-Gren scheme of developing the vast hydroelectric potential in the Rocky Mountain Trench in Canada and transmitting it over 600 miles across the divide to the West Coast is economically feasible and point to similar installations in Sweden and Russia to substantiate their contention.

► **Jerry J. Harrington** has been elected treasurer of the Montana Power Co., succeeding **Harry C. Donaldson**, retired. The new company officer has been head of the auditing department since 1953 and has been with the company since 1930. He recently completed an advanced management program course at Harvard University Graduate School of Business Administration. Edwin H. Duffy has been named assistant secretary and assistant treasurer of the company.

Harrington

► **Wyoming's Public Service Commission** has denied Svilar Light & Power Inc.'s application to expand its service area to include four coal mines surrounding Hudson, Wyo. The commission ruled that its certificate of service restricted the electric utility only to the urban territory of the community and an area one-half mile from the corporate limits of Hudson. The coal mining load in question is in certificated areas of Pacific Power & Light and the Riverton Valley Assn., although neither organization has offered electric service to the area in the past.

► **The Federal Power Commission** has authorized Pacific Gas and Electric Co. to acquire the facilities of its wholly owned subsidiary, Pinole Light & Power Co., and to eliminate it from PG and E's corporate structure. Facilities to be acquired include all of Pinole's operating facilities and distribution systems, the merged properties becoming an integrated part of PG and E's system serving northern and central California. Economy, elimination of duplicate service facilities and better customer service will result.

Financial Notes

Chelan County PUD No. 1 enjoyed a quick sellout of its $250,000,000 bond issue to finance its Rocky Reach hydroelectric project on the Columbia River. The underwriting syndicate paid $96.50 for the bonds which mature in the year 2013 and bear a 5% coupon rate.

Southern Nevada Power Co. declared a dividend of 25c per share on its common stock payable Feb. 1, 1958, to stockholders of record Jan. 10, 1958.

Montana Power Co.'s regular quarterly dividend of 50c per share on outstanding common stock was paid Jan. 27 to stockholders of record on Jan. 6. Preferred stock dividend of $1.50 per share was declared on the company's $6 series and a $1.05 per share declared on the company's $4.20 series—both payable Feb. 1.

Idaho Power Co. realized $21,978,000 from its November sale of 225,000 shares of common stock and $15,000,000 worth of 4¾% first mortgage bonds. These new capital funds will be necessary to finance Brownlee and related projects in 1958.

New capital to the tune of $25,000,000 will be raised by the Pacific Power & Light Co. through the sale of $15,000,000 worth of bonds and 100,000 shares of serial preferred stock which was offered in competitive bidding in mid-January. PP&L faces a record-breaking construction program throughout 1958.

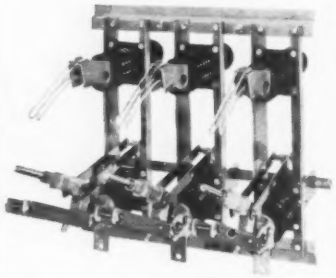
Merger to Enlarge CPU

Plans for merging Southern Utah Power Co. with California-Pacific Utilities Co. are being readied for submission to stockholders of the two organizations. According to E. K. Albert, president of California-Pacific, the proposed merger would create a public utility doing a gross business of over $10,000,000 with 67,000 customers in some 70 Western communities. California-Pacific Utilities Co. would be the name of the surviving company but all operating personnel of the Southern Utah system would be invited to remain with the new organization. Southern Utah's vice-president and general manager, Ralph Thomas, is expected to continue on as vice-president and division manager of the Southern Utah Division of CPU. Warren Bulloch, Southern Utah's president, would become a director in California-Pacific Utilities Co.

► **Construction costs** continue to move upward with *Engineering News-Record's* index 5% higher in January than it was in January 1957. Most of the rise results from increased labor costs as the materials cost component has increased only 1.3% during the past 12 months.

► **Copper prices** are entering a period of relative stability according to T. E. Veltfort, managing director, Copper & Brass Research Assn. For the first time since World War II the world's supply of copper is somewhat in excess of demand and the fabricators now have inventories at the 30- to 60-day level. New known reserves, plus adequate productive capacity bulwarked by long-term labor contracts are reasons expressed for optimism as to copper's availability at a stable price.

SPECIFY 3E AIR INTERRUPTER SWITCHES FOR AUTO-SPEED INTERRUPTION



SPECIFY SAFETY FOR PERSONNEL AND EQUIPMENT. No exposed arc.

SPECIFY ECONOMY, costing less than circuit breakers, and with interrupting capacity not found in air break disconnects.

SPECIFY ENGINEERING ABILITY. 3E's staff of engineers is experienced in adapting or combining equipment for complete switching centers or additions to existing units.

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Political Fronts

President's Budget Highlights

President Eisenhower's budget recommendations, if adopted, may cool off some of the vociferous advocates of nonfederal power. Among other things, he asked for a moratorium on congressional appropriations for the start of new water resources projects by the Corps of Engineers or Bureau of Reclamation. He recommended $1.5 billion, or a $35,000,000 increase over fiscal 1958, for continuation of natural resources projects already under way.

He also recommended that REA be authorized to loan $175,000,000 or $105,000,000 less than in 1958, to electric borrowers and proposed enactment of legislation to assist both electric and telephone borrowers to obtain financing from private sources, and to increase interest rates on future loans for all federal loan programs, including REA.

On the other hand, he upped the current AEC appropriation of $2,212,000,000 by $72,530,000 "to increase the tempo of progress in achieving a greater nuclear military capability and to press ahead in our successful development of the peaceful applications of atomic energy." He recommended $97,700,000 or $6,900,000 more than 1958, for civilian power reactors.

Other bills expected to be introduced this session include one that would revoke Agriculture Department authority over the Rural Electrification Administration and restore to the REA Administrator all administrative functions transferred to the Agriculture Secretary in 1953.

NRECA Blindspot

The National Rural Electric Cooperative Assn. has listed the following as the "top ten issues" before Congress: (1) REA interest rates; (2) REA loan authorizations including loans for telephone co-ops; (3) TVA self-financing; (4) federal atomic power; (5) Hells Canyon; (6) federal power project appropriations; (7) power company advertising; (8) Trimble Bill (to increase time for amortizing projects); (9) power company tax subsidies; (10) Co-op punitive taxes.

Editorial Note: Skeptics in the space age might venture an opinion that such things as missiles, inflation, national security, government debt, recession might qualify also as possible "top ten" contenders.

Everybody's Optimistic —But!

Prevailing on our friend Mike Anderson, computer manipulator par excellence, we asked three questions.

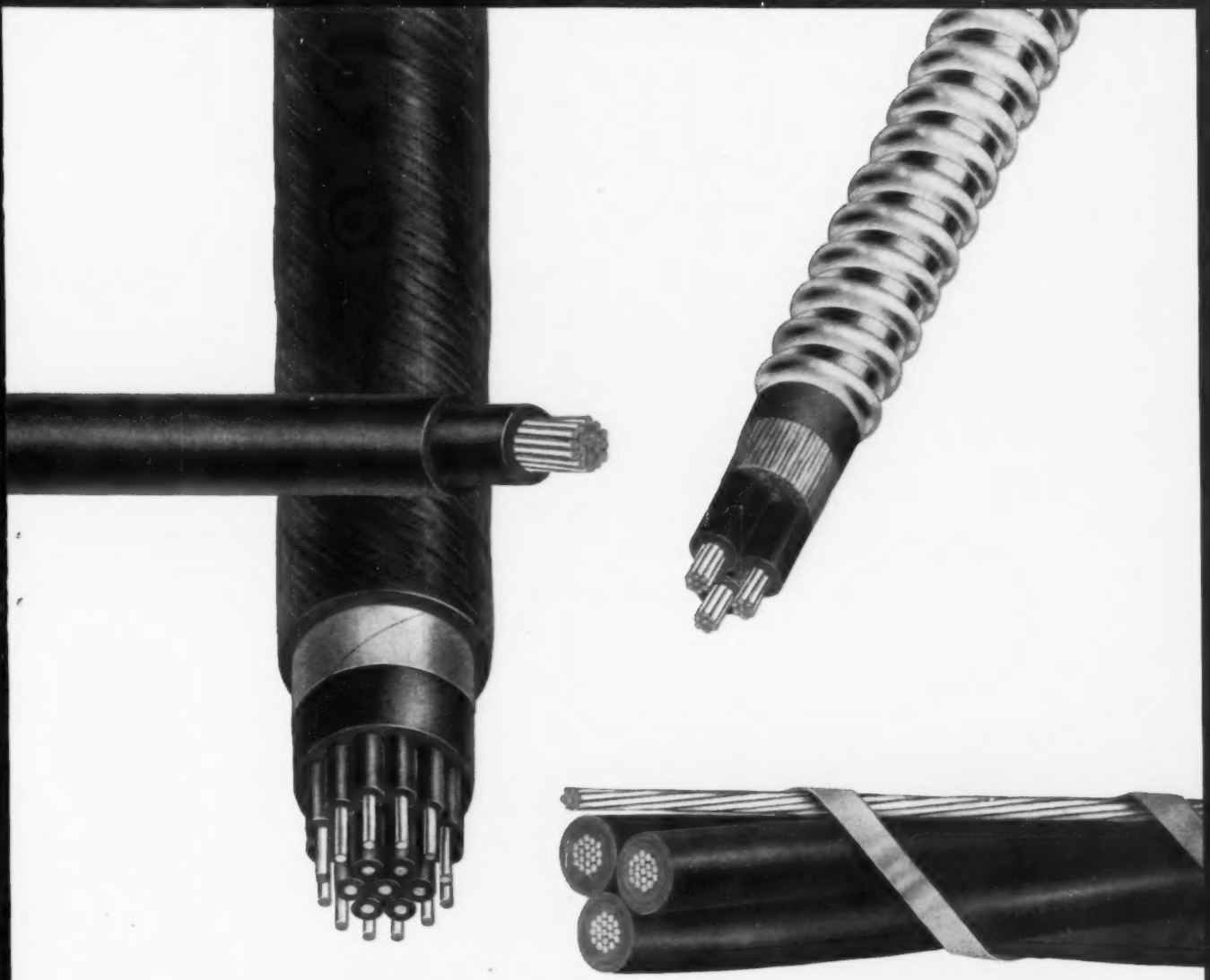
(1) Using actual figures through September, what does it look like the final figure will be? Answer: 121,328,887,000 kwh.

(2) On the average, which group of contestants has made the most accurate guestimates? Answer:

Group	No. of Contestants	Average Guestimate
Executive	61	124,346,972
Consultant	29	124,439,043
Accountant	23	125,401,895
Engineering	240	127,435,473
Commercial	131	127,438,866
Vender	88	129,581,026
Clerical	135	129,868,594
Special Services	26	130,519,015
Operating	269	137,444,947
Contractor	23	144,077,228

(3) Who are the 10 people nearest to today's magic number? Answer:

C. W. Delvey
Pacific Gas and Electric
H. Millen
Pacific Gas and Electric
H. S. Silvernale
City of Seattle
W. H. Nutting
Pacific Gas and Electric
C. L. Ovard
Utah Power & Light
W. C. Porter Jr.
Southern Colorado
J. L. Ballou
Utah Power & Light
H. E. Boyett
Pacific Gas and Electric
V. D. Demarest Jr.
Consultant
W. F. Mulcock
Utah Power & Light



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Houston, San Francisco, Glendale, Cal.

KERITE CABLE

P R I MEMBER

it's the **KERITE** *that makes the difference*

See how they work that

At this giant strip mine, the Tiger Brand Amerclad (shown in foreground below) is tortured by being dragged over razor-sharp rock and constantly pelted by flying fragments that are being blasted. It lies in the sun, rain and snow during the 24-hour workday.

Tiger Brand Amerclad

In wet or dry locations!

VERY FRANKLY, we do not make a range of Tiger Brand Amerclad qualities. When you see the Tiger Brand Amerclad mold identification on a length of portable cord or cable, you can be quite sure that nothing better can be purchased, no matter how much you want to spend for it.

The reason is that American Steel & Wire has catered strictly to the *heavy-duty* market where portable cord or cable is concerned. We're well aware that cable failure can be one of the most exasperating production difficulties that you can encounter. Expensive too, because nothing operates without power.

So the greatest care is lavished on Amerclad. Every inch of cable is vulcanized in a freshly cast lead sheath to insure a dense, tough, homogeneous sheath. Mechanical skimmers remove dross from the lead-melting pots, and the pots themselves are kept in an inert gas atmosphere to prevent formation of impurities.

The result is an amazingly tough and durable cable with precisely centered conductors that withstands mechanical abuse, water, oil, grease, gasoline, ozone, heat and cold. Ask your AS&W salesman for the story . . . and a catalog.

AMERICAN STEEL & WIRE DIVISION
United States Steel, General Offices: Cleveland, O.
Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors
United States Steel Export Company, New York

The workman is holding an electric concrete tamper that knocks the entrapped air out of the mix before it sets—giving a denser, stronger concrete. The tamper is equipped with Tiger Brand Amerclad. It's dragged through wet concrete, over pil:ng and beams, run over by trucks. Yet the manufacturer says he has never had a complaint about the cable.

Watch the **United States Steel Hour** on TV every other Wednesday (10 p.m. Eastern time).

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a standard Tiger Brand cable for every special job

- Asbestos Wire and Cable
- Mold Cured Portable Cord
- Shovel & Dredge Cable
- Paper & Lead Cable
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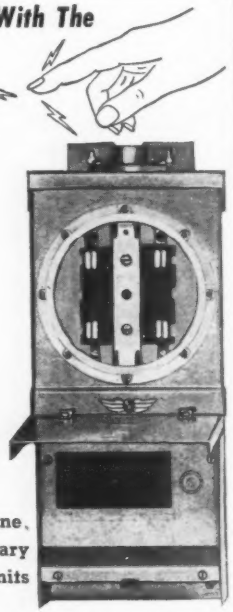
- Interlocked Armor Cable
- Special Purpose Wire & Cable
- Aerial, Underground and Submarine Cable

UNITED STATES STEEL

USS TRADEMARK

The Line With The Golden Touch



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METER MOUNTING DEVICES • THAT'S ALL

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- Meets highest quality standards
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- Contact your *Crapo* Jobber Today!

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Association Affairs

NAED to Golden Gate

Golden Anniversary Convention of the National Association of Electrical Distributors comes to the Golden Gate in June, and preliminary plans are already in the making. W. M. Jewell, Western regional manager, has issued instructions for hotel reservations. They are to be made through the NAED Housing Bureau, Room 300, 61 Grove St., San Francisco 2. Dates of the convention are June 8-12, with a shirt-sleeve clinic on Saturday, June 7, preceding the convention. There will be general convention sessions open to members and guests on Monday, Tuesday and Wednesday mornings, and a members-only convention on Thursday morning. Conference booths in the Civic Auditorium, San Francisco, where the meeting sessions will also be held, will be open from 2 p.m. to 5 p.m. on Monday, Tuesday and Wednesday. The annual dance and banquet will be Wednesday evening. A special atomic energy reactor plant visit is planned for Thursday afternoon. Arthur W. Hooper, executive director, urges members to get their reservations in early as already the Fairmont and Mark Hopkins are sold out.

► First show of its kind in the Pacific Northwest, the 1958 **Pacific Northwest Electrical Industry Exposition** will be staged in the Civic Auditorium, Seattle, Feb. 14-16, at the end of National Electrical Week. Since National Electrical Week originated with Captain Sanislo of Seattle, appropriate celebration for the fact will be the big show of industrial and commercial electrical equipment for the industry. It is being staged by the Puget Sound Electric League Inc. of which R. L. Lemman of Line Material Industries is president. Between 150 and 200 booth spaces in the auditorium will show the latest products and developments to interest architects, electrical contractors, distributors, electricians, engineers, inspectors, plant management, purchasing agents and utility personnel. White goods and TV are not included. Robert Thompson is exposition manager.

EMEA Expansions

Space reserved in the Ninth Biennial Electrical Industry Show of the Electrical Maintenance Engineers Assn. of California indicates that the show will be the largest ever held. Held in Shrine Exposition Hall, Los Angeles, March 27-28, it will have the fifth conference of the EMEA in conjunction with the show.

EMEA recently enlarged its title to include all of California. It amended its articles of incorporation by letter ballot following the success of the organization's growth in the Harbor and San Fernando Valley areas and most recently the starting of the Pomona Valley area section. Charles Hays, president, hopes to see chapters re-established in northern California to make the organization state-wide.

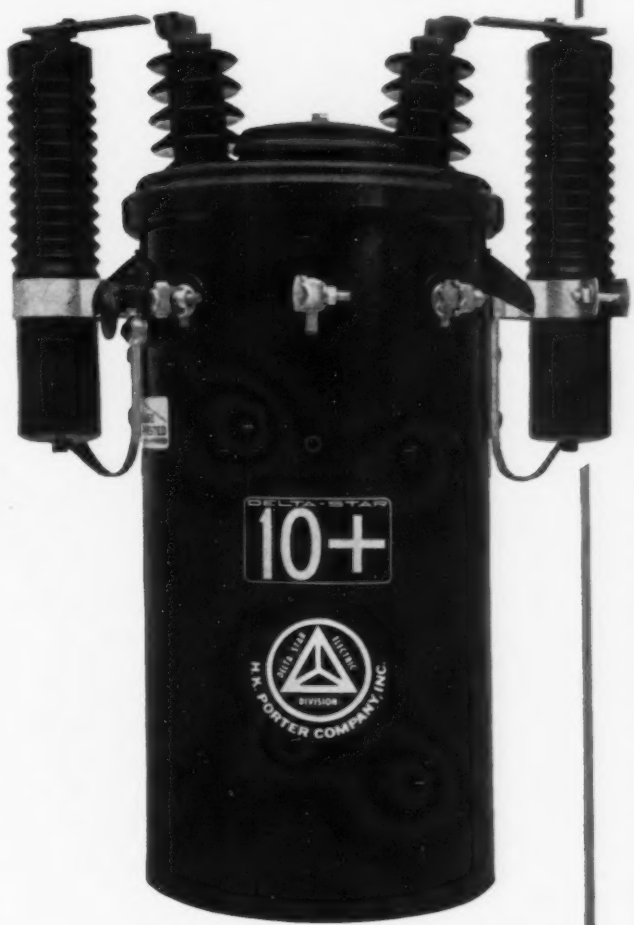
Alvin Goss, manager of Larsen Hogue Electric Co.'s Pomona Electrical Machinery Corp. Division, has been appointed chairman of the new Pomona Valley section. Tom H. Larsen of the same company has become associate editor of the EMEA paper *High Voltage*, assisting Charles Tabor.

Idaho Conference Set

Prior to its annual conference Feb. 15 at the Owyhee Hotel in Boise, the Snake River Valley Electrical Assn. has elected new directors and set a new and lower scale of dues. At a membership meeting Dec. 7, the board of directors set the revised dues schedule to increase membership base for all chapter activities, according to President Harold Toedtmeier. A new class of associate memberships for individuals rather than businesses has been set up. Directors named were Herbert Hetherington, Central District, representing contractors; Frank Ramey, Eastern District, representing retail dealers; Burl Carr, Magic Valley District, representing appliance repair; Stanley Hebron, Eastern District, representing electronics; H. W. Christenson, Central District, representing manufacturers; Maynard Smith, Central District, representing distributors; and William R. Reed, Central District, representing utilities. New 1958 officers will be elected at the annual conference meeting in February.

C. J. Bradford, who for the past two years has been secretary-manager, resigned. Vic Goertzen, Idaho Power Co. and former manager, was named acting secretary-manager. The association is planning full participation in the Live Better Electrically Medallion Homes and the Housepower programs.

NOW... DELTA-STAR creates a new line of Overall Self-Protected Transformers*...



GIVES YOU EVERY MODERN DESIGN FEATURE

Single-Phase, 3kva—100kva
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Delta-Star now offers you the latest, most advanced features in OVERALL SELF-PROTECTED transformer design. This modern transformer protects itself against failures from both internal and external causes. Here are only a few of the principal features. Operating handle sequence prevents accidental tripping. Breakers offer maximum available overload capacity. Safeguard fuse easily replaced. Crystal valve arresters limit line surges. Entire unit conforms to NEMA and ASA standards.

Delta-Star engineering and design is backed by extensive experience in power and distribution equipment. With this background of knowledge and skill, Delta-Star engineers have created an exceptional OVERALL SELF-PROTECTED Transformer—from concept to shipping crate. They have utilized the most modern materials and methods to engineer a fine quality product.

Send for catalog containing complete information on the line of Delta-Star OVERALL SELF-PROTECTED Transformers. Write to: Delta-Star Electric Division, H. K. Porter Company, Inc., 17th and Cambria Streets, Philadelphia 32, Pa.

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Build lines to STAY with the CHANCE 8-WAY!
Give the Guy a CHANCE
This gives you a mole's eye view of what goes on below "see" level when a Chance 8-Way Anchor is dropped into a hole the same size as the base plate and expanded into solid earth all around the hole.
Mike the Mole UNDERGROUND OBSERVER

8-Way Expanding Anchors give you all 'round holding power

Only the Chance 8-Way Expanding Anchor, with its 8 rib-reinforced blades, expands into solid earth *all the way around* to form a pyramid-like square.

This design adds strength to expanding anchors. The pyramid enlarges the effective area of the anchor's holding power. Blades that expand side by side leave no wasted space between them—can be shorter, less apt to bend, and expand in a wide area of solid earth all around the hole.

Make the Chance 8-way *your* standard for the kind of guying you can install and forget. Available from your anchor distributor, in sizes from 60 to 200 sq. in. in area.

. . . and there are CHANCE ANCHORS for all other soil and guying conditions

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► **A contractor, L. M. Stewart,** vice-president of Maxwell's Inc., Spokane, was elected president of the **Inland Empire Electrical League.** He has been a director and section chairman with the supply and apparatus group. Others elected were Earl Dawson, Coeur d'Alene, vice-president; J. J. Thomas, Spokane, treasurer; and Frank A. Tool, Spokane, re-elected secretary and managing director.

Directors elected are Fred Denson, Davenport; Sam Haddock, Moscow; Sam E. Lindsley, Grangeville; W. T. Marineau, Moscow; and from Spokane, Rod Anderson, H. O. Colburn, Kimball I. Jack, Weston Libbey, Charles Nelson, C. A. Pierce, Guy W. Plank, Percy Rhodes and Ralph Shotwell.

Section chairmen elected were W. A. Lowry, appliance section; H. A. Smith, supply and apparatus section; and Don L. Jordin, farm section. Aston is membership chairman; Dave Mozes, electric heating and certified lighting committee chairman; and J. M. Paxton, wiring standards.

► **The Representatives,** Los Angeles Chapter, elected Charles R. Fetty as president; T. Louis Snitzer, vice-president; and Richard A. Strassner, secretary-treasurer.

Organize IES Program

Well organized and in motion already, under the able leadership of Carleton Thompson, San Diego Gas & Electric Co. regional vice-president, the plans for the 1958 Illuminating Engineering Society regional conference at El Cortez Hotel in San Diego, May 12-13, are in the hands of a capable committee. The conference committee, of which J. W. Howard is chairman, meets every other Tuesday, and the December meeting of the San Diego Section featured plans for the conference as its main topic. Other members of the committee are Ralph Rohrbach, vice-chairman; Dave Curtis, attendance; Jim Reading, budget; Ed Peterson and G. S. Kimball, entertainment; William Beran, finance; Charles Edwards, hotel; Mrs. Ed Peterson and Mrs. G. Kimball, ladies' program; C. L. Thompson, papers and program; Al McCutcheon, publicity; Paul Conner, reception; Carl Hotten, registration; Floyd Zweiner, space arrangements and properties; Henry Milse, transportation; G. Atherton-Ely, sergeant-at-arms; Art Collins, audio-visual aids; and Bob Huff, MMIJ contest.

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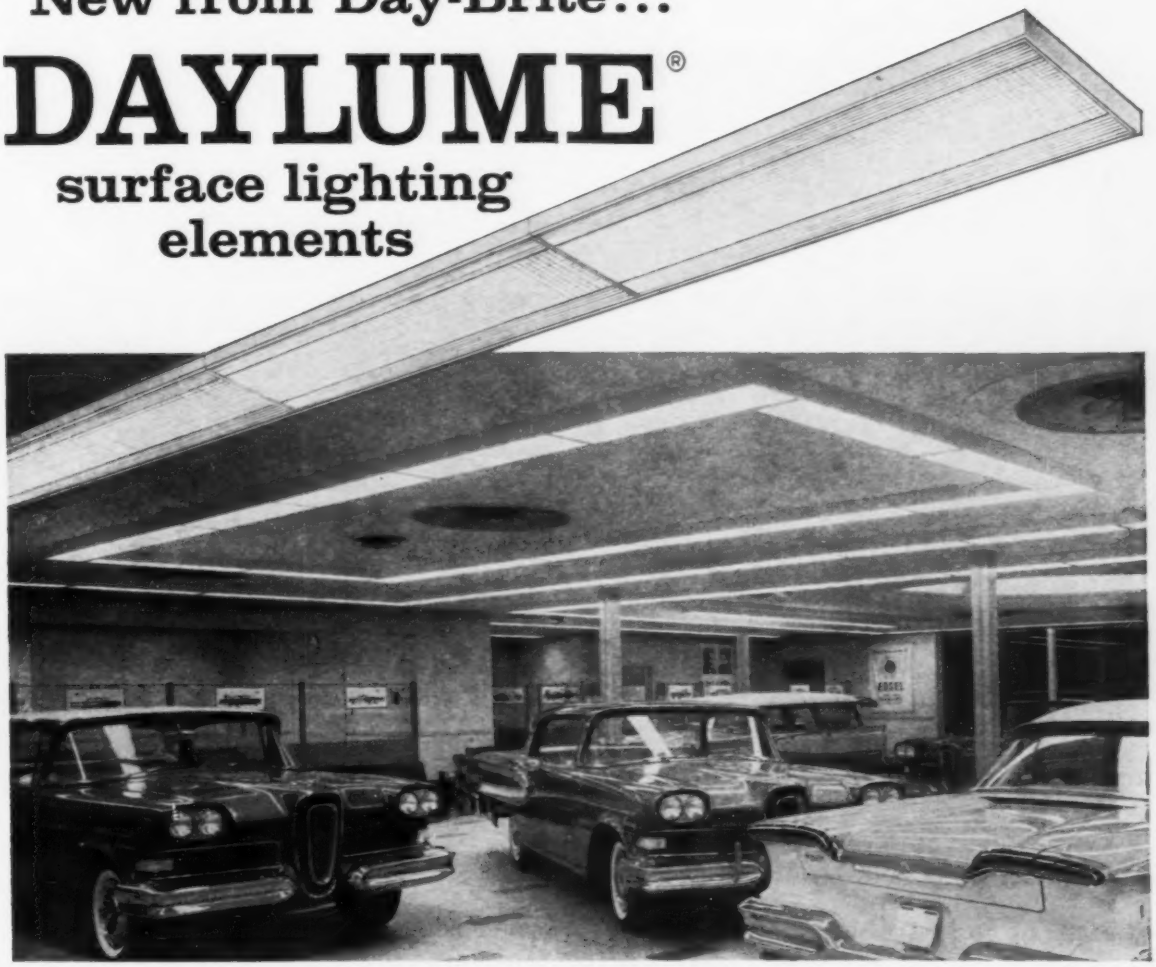
DAYLUME®

surface lighting elements



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DAYLUME combines recessed appearance with surface-mounted flexibility. Only 3¼ inches thin for today's lower ceilings. Available in an unusual variety of enclosures and sizes for extraordinary light control and layout possibilities.

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DECIDEDLY BETTER
DAY-BRITE
Lighting Fixtures

Z-80

Day-Brite Lighting, Inc., of Calif., 530 Martin Ave., Santa Clara, Calif.

NATION'S LARGEST MANUFACTURER OF COMMERCIAL AND INDUSTRIAL LIGHTING EQUIPMENT

Pennsylvania Transformer Introduces *the*

- **FASTER INTERRUPTING TIME**
  Recloser completely clears the line in just 2½ cycles —or twice as fast as the equivalent oil circuit breaker.
- **SAVES UP TO 25% IN COSTS**
  Pennsylvania Suburbanite Substation offers savings as high as 30% in initial costs, compared with other types of substations.
- **EASY TO INSTALL**
  Integral construction simplifies installation . . . keeps costs down.
- **FLEXIBLE IN DESIGN**
  May be supplied with either one or two circuits . . . and with LTC, metering equipment and fuses to meet individual requirements.
- **RECOMMENDED FOR SUBSTATIONS THROUGH 2500 KVA**

Pennsylvania's "Suburbanite" substation was designed specifically for less populated areas in which load conditions are such that relatively little capacity is required and economy is a major factor in the choice of substation equipment.

The Suburbanite provides the desired economy without sacrificing necessary efficiency and safety. It is a compact, easy-to-install substation that utilizes a recloser rather than an air or oil circuit breaker. Mounted in framework attached directly to the transformer, the completely automatic recloser clears the low voltage line in just 2½ cycles in the event of a fault.

Other equipment includes metering devices . . . load tap changing in the low voltage for plus or minus 10% regulation in 32 steps . . . high and low voltage lightning arresters...and high voltage fuses. High voltage lines can be brought directly from the customer's cutout switch (mounted on a nearby pole) to a dead-ending structure on the h.v. side of the transformer.

The Suburbanite saves as much as 25% in initial cost, compared with other types of substations. In many cases, savings also result from the simplicity and ease of installation, which requires a minimum of additional steel work.

The Suburbanite is available with either one or two circuits . . . and can be tailor-designed to fit individual requirements regarding fuses, metering, and load tap changing. For information regarding a specific application, contact Pennsylvania Transformer Division, McGraw-Edison Company, Canonsburg, Pa.

PENNSYLVANIA TRANSFORMERS

PENNSYLVANIA POWER

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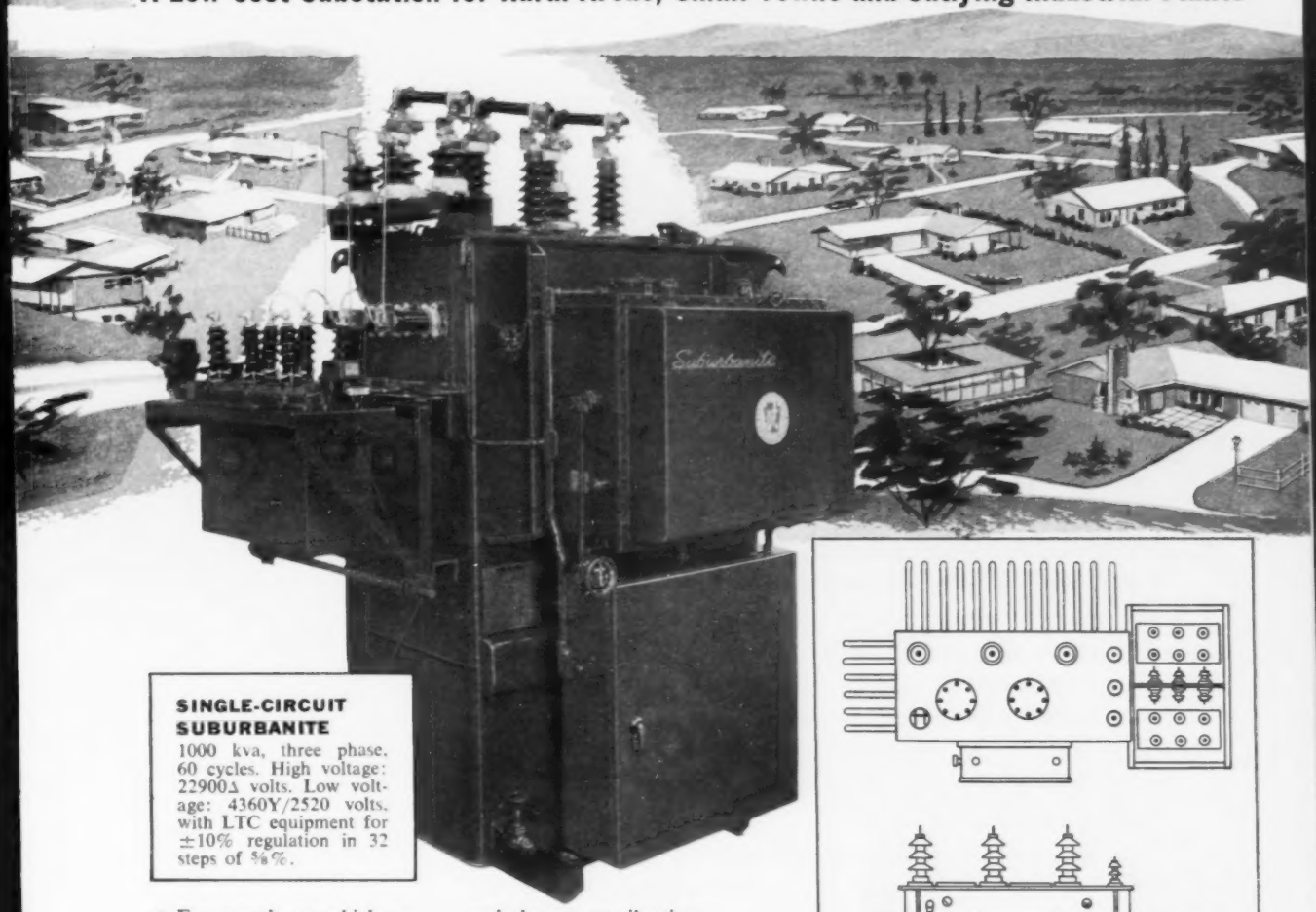
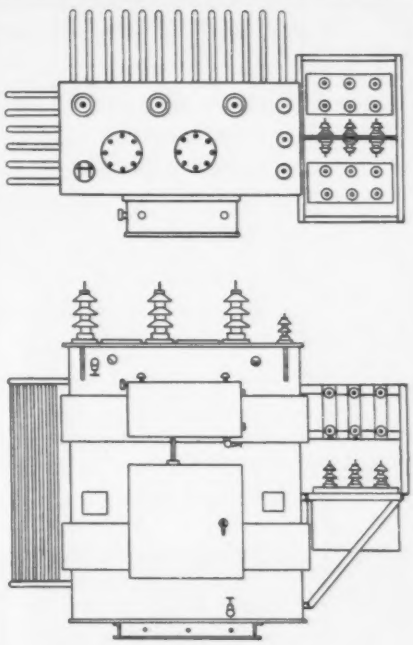
"Suburbanite"

A Low-cost Substation for Rural Areas, Small Towns and Outlying Industrial Plants



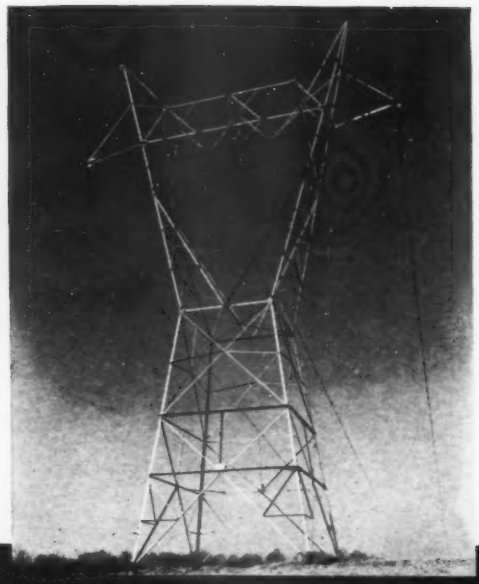
SINGLE-CIRCUIT SUBURBANITE
1000 kva, three phase, 60 cycles. High voltage: 22900Δ volts. Low voltage: 4360Y/2520 volts, with LTC equipment for ±10% regulation in 32 steps of ⅝%.

- Framework on which recloser is mounted is attached directly to transformer. Shipped completely assembled.
- Built-in winch simplifies inspection and maintenance of recloser. Bottom section of recloser tank, with oil, can be lowered—while top section, with contacts exposed, remains bolted to framework.
- Flexible connectors between transformer l.v. bushings prevent strain from thermal changes or vibration.
- Hood of LTC compartment is hinged for easy access.
- Metering equipment is located in easy-to-reach cabinet.
- Sealed transformer tank is reinforced to protect against positive and negative operating pressures.
- Built-in dead-ending structure (not visible in photo) is provided on h.v. side.
- High voltage bushings equipped with fuses.



DUPLEX (Double-Circuit) SUBURBANITE
Includes two automatic reclosers mounted in frames attached to the l.v. side of the transformer. A fault in one l.v. circuit does not affect the other one.

TRANSFORMERS



ONE COAT OF SUBOX PROTECTS GALVANIZED TOWERS FOR 5 TO 8 YEARS

Indeed, a coat of Subox paint often lasts more than eight years . . . and usually without any chipping, cracking, peeling or blistering.

Subox paints are the only American paints made with lead-suboxide. A colloidal pigment, it assures maximum surface penetration . . . packs to form a dense, impervious coating. Furthermore, being *chemically active*, lead-suboxide *actually works* to strengthen and reinforce the film.

Subox paints have been proved under the severest conditions and are used more widely than any other paints for the protection of galvanized towers. Available in attractive modern colors.

Write for brochure: "Corrosion Control of Electrical Structures and Equipment."

SUBOX PAINTS

Subox Inc. *Trade Mark

Established 1924
18 Fairmount Plant
Hackensack, N. J.

People

Bonneville Changes

Harvey M. Sutter, who has been chief of the procurements and contracts branch of the Bureau of Reclamation in Washington, D. C., has transferred to the Bonneville Power Administration as assistant to Administrator William A. Pearl.

Sutter

Sutter will be in charge of procurement, contract administration and supply procedures. He will also serve as chairman of BPA's specifications review committee, and serve as staff liaison officer for claims by and against the government relating to contract work.

Sutter has been head of the Bureau of Reclamation's contracts branch since 1947, and served from 1942 to 1947 with the Denver District Corps of Engineers as chief of the supply division and of the contract termination branch.

Promotions and transfers of other key Bonneville Power Administration operations and maintenance personnel have been announced.

Bernard Goldhammer, chief of the branch of customer service and power requirements, is now commercial operations officer for the Division of Operations and Maintenance, Portland, with district responsibility for all power contracts and marketing.

Paul H. Williams succeeds him as head of the customer service branch.

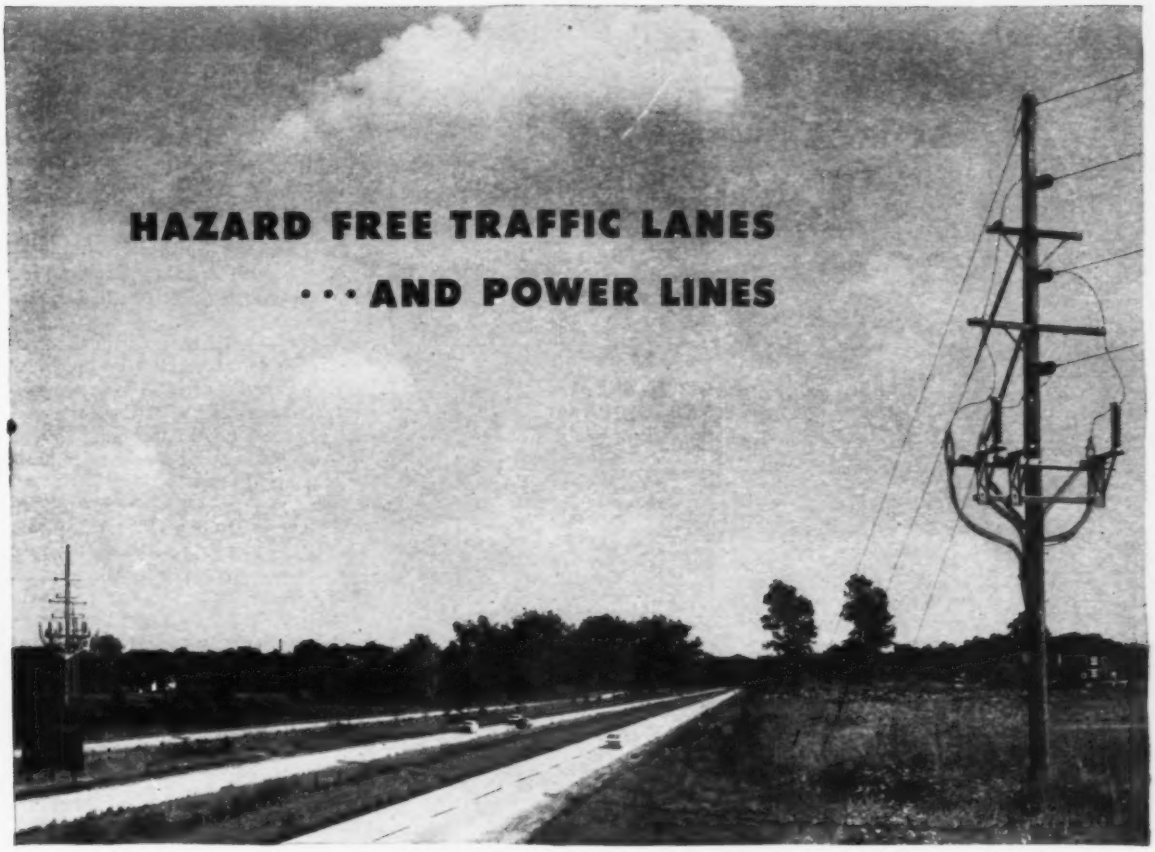
Norman A. Gilchrist becomes operations and maintenance supervisor for the Spokane area office.

Robert J. Tallman will succeed Gilchrist as the Walla Walla district manager.

Charles E. Cartwright will replace Tallman at Wenatchee.

Harold M. Cantrell, Spokane area general engineer and formerly district engineer at Kalispell, will be temporarily assigned to the Kalispell office.

► **K. C. Frazer** has joined the California Division of Essex Wire Corp. and will be associated with its Anaheim plant. His activities will include the directing of chemistry, product engineering and manufacturing control for the magnet wire production at this plant.



This scene of a transition from overhead to underground lines is typical of thousands of others that exist and are being planned to help make more hazard free traffic lanes. At most of these transition points you'll find a few inconspicuous G&W potheads. Their equally inconspicuous features play an important part in their contribution to making more hazard free traffic lanes . . . and power lines.

Type ST potheads provide the safest seal for the cable ends. They eliminate the risk of improperly assembling gasketed joints in the field. Factory assembly of safe metal-to-porcelain soldered (no gaskets) joints places the responsibility of properly sealed joints with G&W. Important also in combating hazardous conditions are the fine textured, spun copper wiping sleeve and top hood that eliminate the possibility of porosity in castings usually used in potheads.

Be safe—request Bulletin AA56 for help in specifying ST potheads for cables up to 69 KV and 2500 MCM.

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3500 W. 127th ST., BLUE ISLAND, ILLINOIS

A582

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Monarch

renewable fuses

FASTER UNIFORM SHORT CIRCUIT PROTECTION

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ELECTRIC CORPORATION
Jamestown, New York

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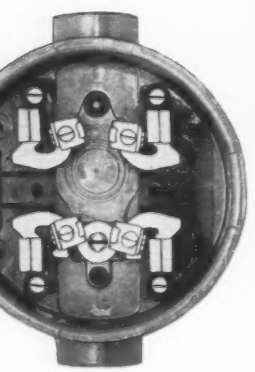

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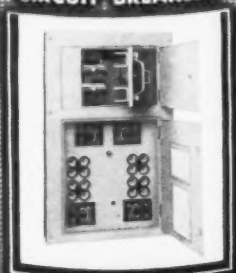


200 AMPERE FUSIBLE MAINS

FOR RANGE—DRYER—WATER HEATERS
HEATING PANELS—AIR CONDITIONERS

The VADSWORTH Electric MFG. CO. INC.
COVINGTON, KENTUCKY

WRITE FOR NEW FREE CATALOG

Division Changes

J. A. Blessinger has been appointed district manager at Walla Walla for Pacific Power & Light Co. He takes over responsibilities formerly held by Homer Beale, who is now assistant general manager of the company with general supervision over the northeastern section of the company's territory.

In the same division, Joe Schneider has been selected to succeed Fred Eckel, who has retired as local manager at Wapato.

William C. Kinard, formerly commercial and industrial sales engineer in Walla Walla, will be district manager at Dayton. James E. Beck, who had been acting district manager at Dayton, joins the general sales staff as lighting sales director in Portland.

► **John J. Hayes,** Pacific Coast treasury manager for Westinghouse Electric Corp., retired recently after 48 years with the company. He joined Westinghouse in 1909 in Seattle as an office boy. Hayes holds the "Order of Merit," highest award conferred by Westinghouse directors for outstanding service by employees.

Hayes

► **R. E. Fife,** financial vice-president of Southern California Edison Co., retired Jan. 1 after 38½ years service with the company. Fife has been prominently identified with Edison's financial activities through most of his career, and as an Edison officer during the past 12 years he has helped lead the company during its period of greatest growth.

Fife

► **James W. Allen** has been appointed vice-president of Pacific Electric Motor Co. in Oakland.

► **Jim B. Hartwig** is the new holder of the Electrical Man of the Year title at Seattle. Hartwig is vice-president and general manager of North Coast Electric Co. He received a plaque from the Puget Sound Electric League on Jan. 7 for his service to the electrical industry in the area.

► **Henry J. Johnson** has been appointed auditor for Public Service Co. of Colorado. Johnson joined the utility in 1940, and has had service in several accounting departments as well as the auditing department. He succeeds **Robert Haddock**, who retired after 45 years with Public Service Co. and its predecessors.

Johnson

Kaiser Reorganization

The new organization of the Electrical Conductor Division of Kaiser Aluminum & Chemical Sales Inc. in the 11 Western states has been announced.

L. M. Guibara is electrical conductor regional manager. Under him are three district offices located at Los Angeles, Oakland and Seattle.

Supervisors of the offices are J. E. Muller, Los Angeles; E. L. Bledsoe, Oakland; and E. H. Bastedo, Seattle.

► **David G. Taylor** leaves the Bay area to assume the new position of switchgear technical specialist with Federal Pacific Electric Co. in St. Louis. Taylor is a graduate of the University of California, and served with Westinghouse, Great Western Power Co. and Gardner Electric Mfg. Co. He joined Federal Pacific with the merger of Gardner.

Taylor

► **Henry Gluck** has been named vice-president in charge of sales for Sunbeam Lighting Co. He joined the company as sales manager last spring.

► **C. D. Ramsden** has been named president and general manager of the Pacific Coast Engineering Co., Alameda, Calif. He joined PACECO in 1946 as chief engineer. In 1956 he was appointed vice-president and general manager, and has been a director since 1948.

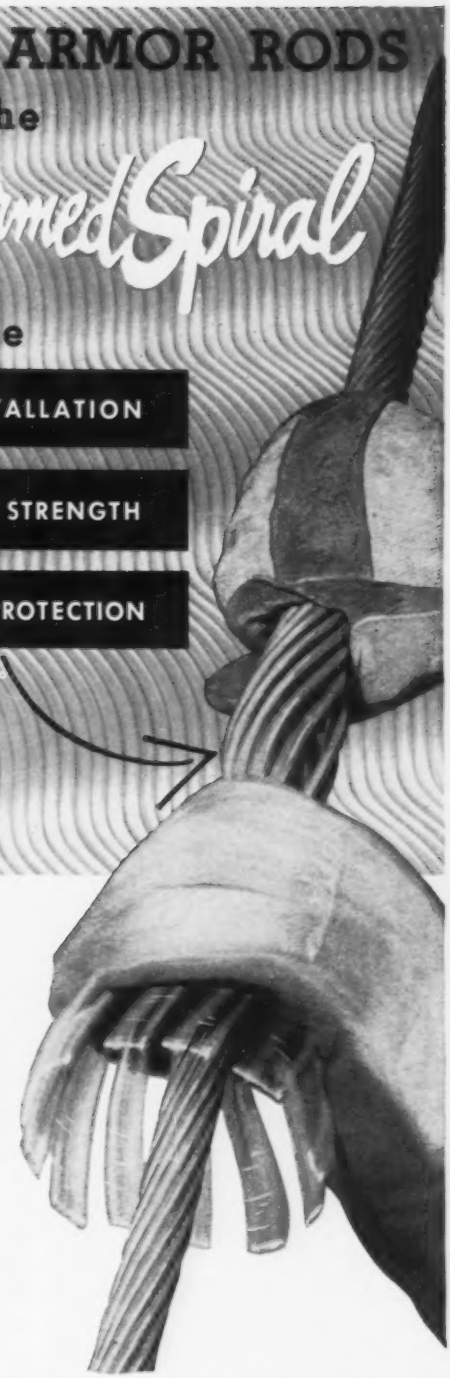
Ramsden

FANNER ARMOR RODS with the Superformed Spiral provide

EASIER FIELD INSTALLATION

GREATER GRIPPING STRENGTH

LONGER-LASTING PROTECTION



• **EASIER FIELD INSTALLATION**

"*Superforming*" of special spring-type wire at factory into uniform spirals that snap perfectly into place by hand without the use of tools . . . eliminates costly, haphazard field fabrication of armoring.

• **GREATER GRIPPING STRENGTH**

The "close-pitch" spiral of "*Superformed*" Armor Rods winds around conductor developing a permanent non-slip full length grip that is stronger and tighter than made by any other method of armoring.

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"*Superformed*" Armor Rods reduce conductor strain...prevent conductor pitting and wear . . . eliminate hazards of end clamps

To get the best — specify Fanner "*Superformed*" Armor Rods. Get acquainted with the important savings they offer by writing for descriptive literature today.

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URL and URF REGULATORS...

WITH ALL THREE FEATURES

FOR CLOSER REGULATION

Westinghouse URL and URF regulators — with the complete combination of 1¼% step voltage regulation, inverse time delay relay and the instant-response tap changer — hold set voltages with *only ⅓ to ½ the voltage error of any other regulator.*

This means that you can carry greater loads and produce more revenue . . . because:

- The narrower effective bandwidth allows lines to be stretched further — without additional regulators.
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Call your Westinghouse representative for the complete story of the benefits of better regulation . . . made possible by PLOWBACK OF EARNINGS into further investigations of the electric utilities' problems of electrical distribution. J-70858

YOU CAN BE SURE...IF IT'S Westinghouse

► **Ralph N. Conner** has been named southwestern district manager by the Baldwin - Lima-Hamilton Corp. He has been with B-L-H for 18 years, and was formerly assistant manager of this same district. The district is comprised of southern California, Arizona, New Mexico and Colorado.

Conner

► **Paul Ogilvie** has been named sales manager for Pacific Union Metal Co., manufacturer of street lighting standards. Ogilvie was formerly a sales engineer with the firm. Before joining Pacific four years ago, he was affiliated with Pacific Gas and Electric Co. in San Francisco and with the Line Material Industries.

Ogilvie

► **Richard Russell** has been appointed Pacific Southwest regional sales manager for the Square D Co. He will continue as industrial control promotion manager, a position he has held since 1953. The territories of Phoenix, San Diego and Honolulu will be added to his present area. Russell has been with Square D 22 years.

Russell

► **John Billings** has been selected to serve as sales manager for General Electric service shops in northern California and western Nevada. It is a new position. Billings has been with G-E in the Bay area for the past 10 years. He will headquarter at 1098 Harrison in San Francisco.

► **Edward C. Sylvanus,** consulting electrical engineer, recently moved to new offices at 3038 Rowena Ave., Los Angeles. A member of AIEE, IES, IBEW and Construction Specification Institute, he has served on the Los Angeles City Electrical Code Advisory.

With the Contractors

When Ronald Reagan, TV and movie star, (center) was feature speaker at the Electrical Contractors Division, Bureau of Home Appliances of San Diego County he congratulated the new chairman, Ward Howard, (right) on the success of the big Electrical Construction Show and conference, in November at which 39 makers of electrical equipment exhibited and some 1,500 viewed exhibits. At left is Alan J. McCutcheon, Jr., coordinator, and Neville Baker, past chairman

► **Sixteen electrical contractors** and four utility men received certificates in Denver for successful completion of the EEI Housepower training course. They were awarded at a dinner, by Guy Thomas, president of the Rocky Mountain Electrical League, and Don Larson, manager of the Rocky Mountain Chapter of NECA.

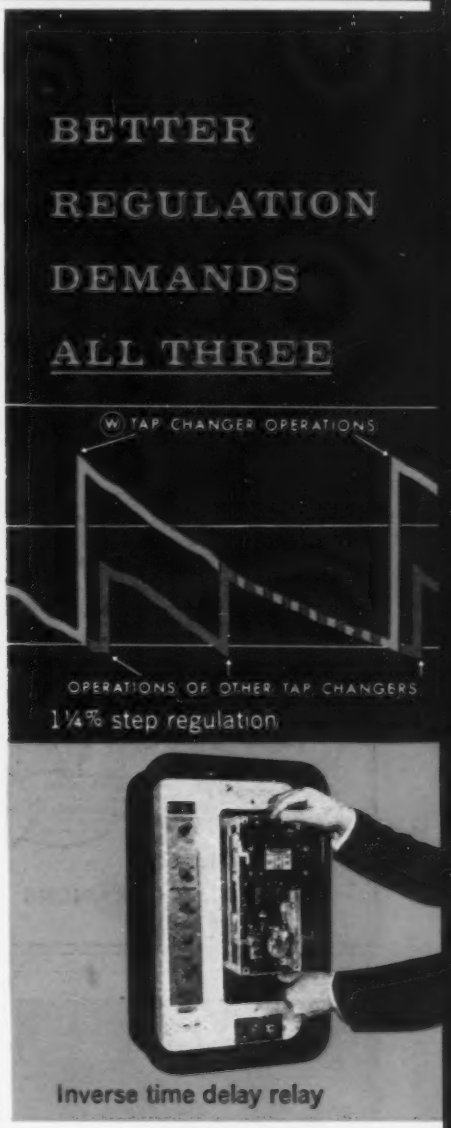
► **A new one-story office building** is being erected by Portland Local No. 125 of International Brotherhood of Electrical Workers. It is at N. E. 18th Avenue and Davis Street on a 100x100 lot. It will contain a conference room, offices and general office space. Naturally, it will be electrically heated.

► **A bill stuffer tie-in** with the Electrical Industry Fund of Contra Costa County is being sent by Pacific Gas and Electric Co. to all of its customers in that county. It is a modification of the lead-off ad used by the Industry Fund in its series of 48 ads appearing in 18 newspapers.

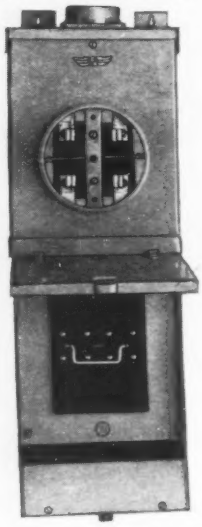
► **New ways** the electrical industry can help builders was the theme of a special meeting, Jan. 20, in conjunction with the convention of the National Association of Home Builders in Chicago. Among the topics covered was "Lighting" by T. Cox, director, American Home Lighting Institute, and H. H. Green, General Electric, Cleveland; and "Wiring" by L. E. Barrett, chairman, executive committee, National Wiring Bureau. "Electric Heating and Cooling" was covered by C. F. Kreiser, E. L. Wiegand Co., chairman of the electric heating committee and S. B. Aronson, sales manager, Berko Electric Mfg. Corp., as well as William McGrath of Carrier Corp.

► **Scottsdale, Ariz.,** will be a popular meeting place for many of the National Electrical Contractors Assn. top committees in 1958.This is because Oliver Barnett, NECA president, has a winter home and a shop in the resort city. The NECA marketing committee met Jan. 10 and 11. The executive committee met Jan. 13 to 17.

► **Bathroom shaving** in Canada with electric razors has not been legal up to now. A new approved combination isolating transformer and electric shave receptacle is now permitted to be located in the bathroom, but is required to be placed as far as practicable from the bath tub. Contractors in British Columbia were so notified by Lance Robson, inspector of electrical energy for



THE LINE WITH THE GOLDEN TOUCH



A NEW LINE OF

100-200 Amp Pullout & Meter Socket Combinations

Underwriters' Laboratories Approved

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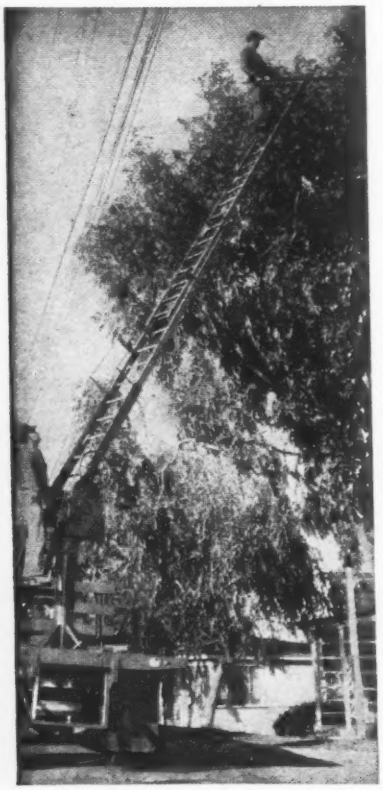

SURGICAL LINE CLEARANCE BY DAVEY

Davey is doing line clearing for 12 Public Utilities on the Pacific Coast —most of them served continuously for over 20 years. Davey specialized equipment and efficient methods save money . . . Davey surgical pruning benefits trees—builds goodwill.

DAVEY LINE CLEARING
DIVISION OF
DAVEY TREE SURGERY CO., LTD. OF CALIFORNIA
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Story Bldg., Los Angeles, TUcker 1929

DAVEY ORIGINATORS OF TREE SURGERY

the province, and Lorne Ryan, city electrician, Vancouver. The requirement is a new one in the Canadian National Code. The device also contains a current-limiting cut-off. All these devices are mounted on the back of the cover plate that fits a 4-in.-square outlet box with a minimum depth of 2⅛ in. Maximum output of the approved unit is 20 va.

► **A jurisdictional hassel** is being seeded by the California State Division of Highways in regard to the installation of frames to hold illuminated highway signs. The division formerly called for separate bids on the lighting installations, but of recent months now only asks for wiring. Electrical contractors have to compete with steel constructors on the steel work. Standards are used as raceways, and IBEW feels that these are in its jurisdiction. Electrical contractors do also.

► **Contractors in the Inland Empire** of Washington are making constantly more residential and commercial installations of electric space heating despite the recent invasion of the Pacific Northwest by natural gas. Reports of installations to Washington Water Power in October alone were 217 jobs, and for the year has been more than 1,300 of the residential type and about 400 commercial jobs. Both Inland Empire Chapter, NECA, and the Inland Empire Electrical League have carried on electric heating promotion with the utilities.

► **Lighting maintenance** sales should improve when the results of a survey made in San Diego are used in selling. To measure how much lighting depreciates after installation a year or so, San Diego Gas & Electric Co. checked foot-candle readings of previously measured jobs representing a good cross section of fluorescent-lighting types. Maintenance on these was also noted. Lighting handbook data usually estimates depreciation to be around 30%. Where the lighting was maintained and lamps replaced on a group basis foot-candle readings were the same as when the job was installed. With reasonably good maintenance, the percentage of light decrease was less than 20%. Poor maintenance resulted in as high as 51% decrease in one instance.

► **Housepower in 1958** will be promoted with a $100,000 prize contest, $10,000 of which is in cash prizes and $90,000 in appliances provided by manufacturers.

Public Power

REA Expands

A loan of $4,246,000 has been approved by the REA for Moon Lake Electric Assn., Vernal, Utah.

The loan will finance the installation of four new 3,000-kw diesel generating units adjacent to Moon Lake's Rangely, Colo., plant. Also included in the expansion are 31 miles of 69-kv and 43 miles of 115-kv transmission lines, related substation facilities and system improvements.

This will bring the total number of customers of Moon Lake up to about 2,900.

Tax Change?

A constitutional amendment to remove the tax-exempt status of public power districts will be introduced into the Arizona legislature, according to Representative David H. Campbell of Maricopa County.

The amendment would lift from power districts their present designation as political subdivisions, and make interest on bonds from such districts subject to taxation.

A similar proposition last year died in committee.

Opposing Trinity

Sacramento Municipal Utility District is actively opposing partnership development of the Trinity River portion of the Central Valley Project.

The SMUD board of directors based their action on estimates that private development of Trinity River power would remove from the Central Valley system a block of low-cost power that will be needed by federal and public agencies.

Pacific Gas and Electric Co. is presently attempting to get authorization to construct the power plants.

SMUD's action is the same as that of the Northern California Municipal Electric Assn., which includes 11 cities. The association's delegation was made up of three representatives.

REA Loan

Kootenai Rural Electrification Assn., Coeur d'Alene, Idaho, has received approval for a $100,000 REA loan to help rural consumers on the system finance wiring of their premises and the purchase and installation of electrical appliances.

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Portland	10	2318 N. W. Vaughn Street	CApitol	8-4173
Seattle	9	306 Dexter Avenue	SEneca	2368
Spokane	8	121 S. Monroe Street	MAine	4-4326

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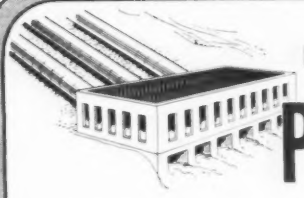

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PENSTOCKS
FOR HYDRO DEVELOPMENTS

Location is one reason why Gate City Steel of Boise is the logical place to buy fabricated penstocks and other steel components for western hydro projects. Why not let us show you some other good reasons? Write:

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Box 1487 Boise, Idaho

Executive Offices: Denver, Colorado
Fabricating Plants: Boise, Idaho and Omaha, Nebraska

Market Development

IEA Honors Huckins

Life membership in the Intermountain Electric Assn. was presented to W. A. Huckins, manager of the UP&L Business Development Department, by Vern Sharp, Sharp Electric, at a dinner in Salt Lake City attended by 225 members and guests.

Sponsored by the Salt Lake Retail Chapter, the dinner honored all honorary life members with presentation of new plaques resembling their life membership cards.

Huckins was cited for a lifetime of service to the association and the electrical industry of the West. Mrs. Huckins also was honored for her support during the years.

Receiving plaques were Jacob A. Kahn, first president of the association in 1920; Franklin S. Cundiff, L. E. Brown, B. C. J. Wheatlake, Ernest Dee, James L. Schricker and L. John Christensen. Life members unable to attend the party who will receive plaques later are E. E. Bracier, Sam W. Leaver, W. E. Fleetwood and E. F. Schettler.

New Setup

Instead of assigning individuals to its 1958 promotion committees, Rocky Mountain Electrical League has named companies to each campaign. The companies in turn name a representative on the committee, assuring continuity of effort.

This new idea is the brainchild of Shirley Huntsman, Public Service of Colorado, sales promotion chairman, Ward Terry, distributor chairman, Leonard A. Robohm, dealer chairman, and Ralph Hubbard, RMEL manager.

The modern laundry promotion committee, functioning through February, is headed by Harold Pedersen of Maytag. Committee members are Monty Werner, Frigidaire; Bill Campbell, Parker; Charles Zender, Westinghouse; Jim Jeffers, Sears-Roebuck; Art Cross, G-E; Bill Becker, Iron-rite. The same group will serve during the dryer promotion in late October and November.

► **Western Appliance** Corp. of Denver recently flew 48 dealers and salesmen from three Mountain states to the West Coast on a holiday trip. The tour was their reward for making the nation's highest per capita sales of RCA Whirlpool equipment.

Westinghouse

SPACE-MISER

NETWORK TRANSFORMER

This is a modern design network transformer produced to the exacting requirements of modern network systems. It provides high utilization kva together with greater reliability, reduced maintenance and simplified inspection. It affords the reserve ability necessary for emergency operating conditions. The SPACE-MISER, with its greatly reduced size, is made possible through advanced engineering, materials and manufacturing techniques developed by Westinghouse Transformer Division.

FIRST WITH THE FUTURE

THE DECAL TELLS ALMOST THE FULL STORY

The decal reproduced above is applied to every Westinghouse SPACE-MISER network transformer. It tells almost the full story . . . almost—but not quite. What it doesn't tell is that:

The new SPACE-MISER has been reduced *12 inches* in height—it can now be mounted off the floor of the vault.

The new SPACE-MISER weighs *20% less*—installation is easier, faster; handling is safer.

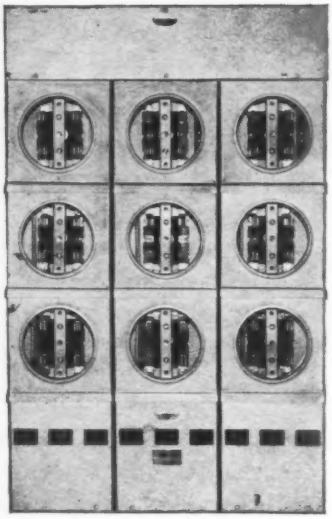
The new SPACE-MISER occupies *15% less* vault space—less cramped vaults mean easier maintenance.

The SPACE-MISER is another example of how Westinghouse Plowback of Earnings—into research . . . and development of better materials with more efficient utilization of existing materials—produces the improvements that set the pace in helping electric utilities keep electricity America's biggest bargain.

You can get the full story of what the SPACE-MISER offers for *your* network operations by calling your Westinghouse sales engineer . . . J-70854

YOU CAN BE SURE...IF IT'S Westinghouse

THE LINE WITH THE GOLDEN TOUCH



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Combination Meter
and Breaker Assemblies
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METER MOUNTING DEVICES • THAT'S ALL

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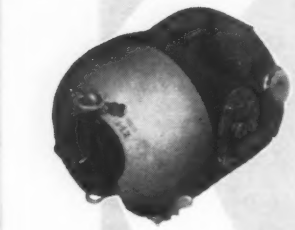

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McCall Award Winners

Three out of five home economists receiving the 1957 Laura McCall Award were from the West: Evelyn Hansen, Utah Power & Light home service director; Maxine Gentis, Sacramento Municipal Utility District senior home economist; Erma Meeks Boyen, Hawaiian Electric home service director.

Miss Hansen, a previous winner, took the award this year on her water heater presentation (EWEST, July, p 122); Mrs. Boyen, another former winner, for an educational program among college students on the work of a utility home economist; Mrs. Gentis, for outstanding accomplishment made by her department in one year.

► **RCA Whirlpool** will add a line of gas refrigerators. It recently purchased for about $6,500,000 Servel facilities and patents for its gas refrigerator and ice maker.

► **In-store displays** of electric fans will be eligible for awards in the NEMA contest this year. A new theme "Summer's Coming—Buy Fans Now!" and a lengthened contest period, April 15-June 15, are other changes in this annual contest. Anyone who sells or displays electric fans can enter by submitting a photo of his display, window or in-store, to: Fan Display Contest, Electric Fan Section, National Electrical Manufacturers Assn., 155 E. 44th St., New York 17.

► **Washington Water Power** Co. reports that its employee speakers bureau made 298 talks and showed films 463 times during the first 10 months of 1957.

► **A new division**—Hi Fi-FM—has been formed by Electric League of Los Angeles. The league's managing director, Glen Logan, is president of the International Association of Electric Leagues.

► **Trade-in Guides** for 1958 were distributed to all members of the Appliance Merchandisers Assn. at Phoenix by action of the board of directors.

► **Promotion calendars** are a good means of reminding dealers to tie in with industry campaigns. Among utilities and leagues sending them out in various forms are Arizona Public Service, Idaho Power, Pacific Gas and Electric Co., San Diego Bureau of Home Appliances.

School Program

A program to teach home economics students in the Portland Public Schools how to live better electrically is being carried on jointly by Pacific Power & Light and Portland General Electric companies.

Described by Dr. Justine O'Reilly, home economics supervisor for the schools, as an "outstanding contribution to our instructional program," the course is offered by four utility home economists: Anne Ogden, Grace Schoeni and Patty Post of PGE and Grace Phipps of PP&L.

Lectures include: Know your electric range; Living with a home freezer; Modern laundry techniques; See your home in a new light; Your own room in a new light (for elementary grades); Dishwashing know-how; Kitchen planning; Selection and care of portable kitchen appliances.

Sales People in the News

John J. Perry Jr. has been made sales manager for Mountain Appliance Distributors Inc., Denver, distributor for Philco in the Rocky Mountain area.

Harry Dunlap has the distinction of having retired twice, first from Westinghouse Supply in April 1954 and last month from Stubbs Electric of Portland. When he left Stubbs, he and six other members of the old Fobes Supply, predecessor of Wesco (where Dunlap started in 1918) got together for dinner. The group included Ralph Sroufe and J. E. McColm of Stubbs, Ernie Hugill, M. F. Hobkirk, Lawrence Tynan of Wesco and Ralph Tynan of G-E Supply.

Vern W. Newsome, formerly secretary to the chairman of the board of Utah Power & Light Co., has been appointed chief clerk of the business development department of that company. He succeeds Nell G. McCarrel.

Marguerite Fenner, home economics director for Pacific Gas and Electric Co., was one of the panel discussing "Appeal to Your Appliance Prospects" at the second annual Live Better Electrically Women's Conference in Chicago, Jan. 10.

Blanche M. Hollingsworth has been appointed Preston home economist for Utah Power & Light Co.

Kenneth L. Miller has joined the Stubbs Electric staff at Portland as new apparatus specialist.

Gene Rodeback, appliance department manager for Olds & King in Portland, won Maytag's international dealer contest for best window display.

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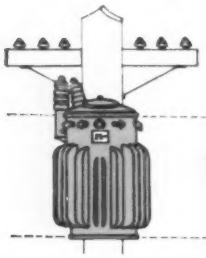

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Manufacturers—Distributors

► Harvey Machine Co., Torrance, Calif., changed its corporate name to **Harvey Aluminum,** effective Jan. 10.

► **Philco** has extended its manufacturing agreement with Avco Crosley Division until May 1961. Philco's laundry equipment and electric ranges are being made at Crosley's Nashville, Tenn., plant.

► Bernie Spencer's **Industrial Sales and Service,** Fallon, Nev., is a new distributor for Allis-Chalmers motors and pumps.

► **Gregnall Co.** of San Francisco has been appointed Blackstone distributor to replace J. J. Lukanish Co., which went out of business late last year. John Gregory, who heads Gregnall, has handled the Apex, Capehart and Sub-Zero lines. Offices are at 1355 Market.

► **Electric Sales Co.,** manufacturers' agent, has moved to 2067 Cedar Ave., Long Beach, Calif. Former address was 837 Traction Ave., Los Angeles.

► **H. R. Basford Co.,** which has distributed the Hamilton laundry line in northern California, will handle it also in southern California. Otto Barth will be the company's representative in the southern area.

► **Sprague Electric Co.** will expand its Pacific Coast manufacturing operations with a plant at Visalia, Calif. Scheduled for completion late in the spring is a 21,000-sq-ft building to house all manufacturing facilities now located at Sprague Pacific's headquarters at Venice in the Los Angeles area. According to President Julian K. Sprague, the move is being made to locate the company's Western manufacturing plant midway between its two principal Pacific Coast markets, Los Angeles and San Francisco.

► **General Motors** is adding 10,825 sq ft to an existing 26,787-sq-ft training center near Portland to give classrooms for Frigidaire, Detroit Diesel Engine Division and one for general use. William F. Hufstader, vice-president in charge of distribution, said increased activity in its nonautomotive divisions has required additions in all areas.

► **Hill Transformer Co.** of San Carlos, Calif., is setting up a special Industrial Products Division for production of special-duty transformers. Types and sizes will be produced for all industrial applications, with designs to individual specifications and units built to NEMA and ASA standards.

► **Westinghouse Electric Corp.** has under construction an 88,000-sq-ft plant in Compton, Calif. The new facility will house manufacturing and repair services for industrial electrical apparatus. Carl W. Waldow will be manager.

► **General Electric Supply Co.** at Denver finished moving into its new office and warehouse building during the holidays. The one-story structure has 73,000 sq ft of floor area and permits consolidation of operations from three locations. G-E Supply's housewares and supplies department and the Hotpoint Appliance Sales Co. will be housed there. G-E Supply also has a new district manager at Denver, A. E. Fleming, who went there from Salt Lake City. He has been with the company for more than 15 years.

► **Commercial Lighting Equipment Co.** of Los Angeles has opened a branch in Denver for distribution of its line of sports and commercial units. J. B. Abel of Pittsburgh, Pa., is sales representative and J. B. Bonine of Toledo, Ohio, field engineer for the new branch.

► Elton S. Bailey, owner of **Refrigeration Equipment Co.** in San Diego, has announced the sale of the commercial division of his business to Oscar Shaddox, Harry Bailey and Arthur Eberle, employees of the firm. The appliance division will remain under Elton Bailey's ownership, with Paul Lipka as sales manager and Charles Cobler as service manager.

► **Clarke Sanding Machine Co.** of Muskegon, Mich., has purchased Modern Power Sweeper Co. of Azusa, Calif. Production will be continued at the Azusa plant for the present, according to President Ernest Cooper.

► **Murphy-Hain Co.,** 2133 Bay St., Los Angeles 21, has been appointed sales agent for the Spang-Howarduct Division of the National Supply Co. Territory includes southern California, Arizona and southeastern Nevada. The company also handles Spang conduit, made by the Spang-Chalfant Division.

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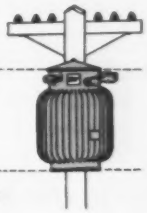

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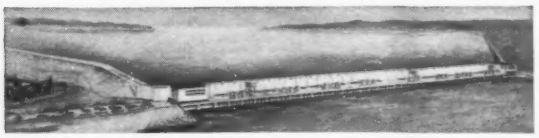
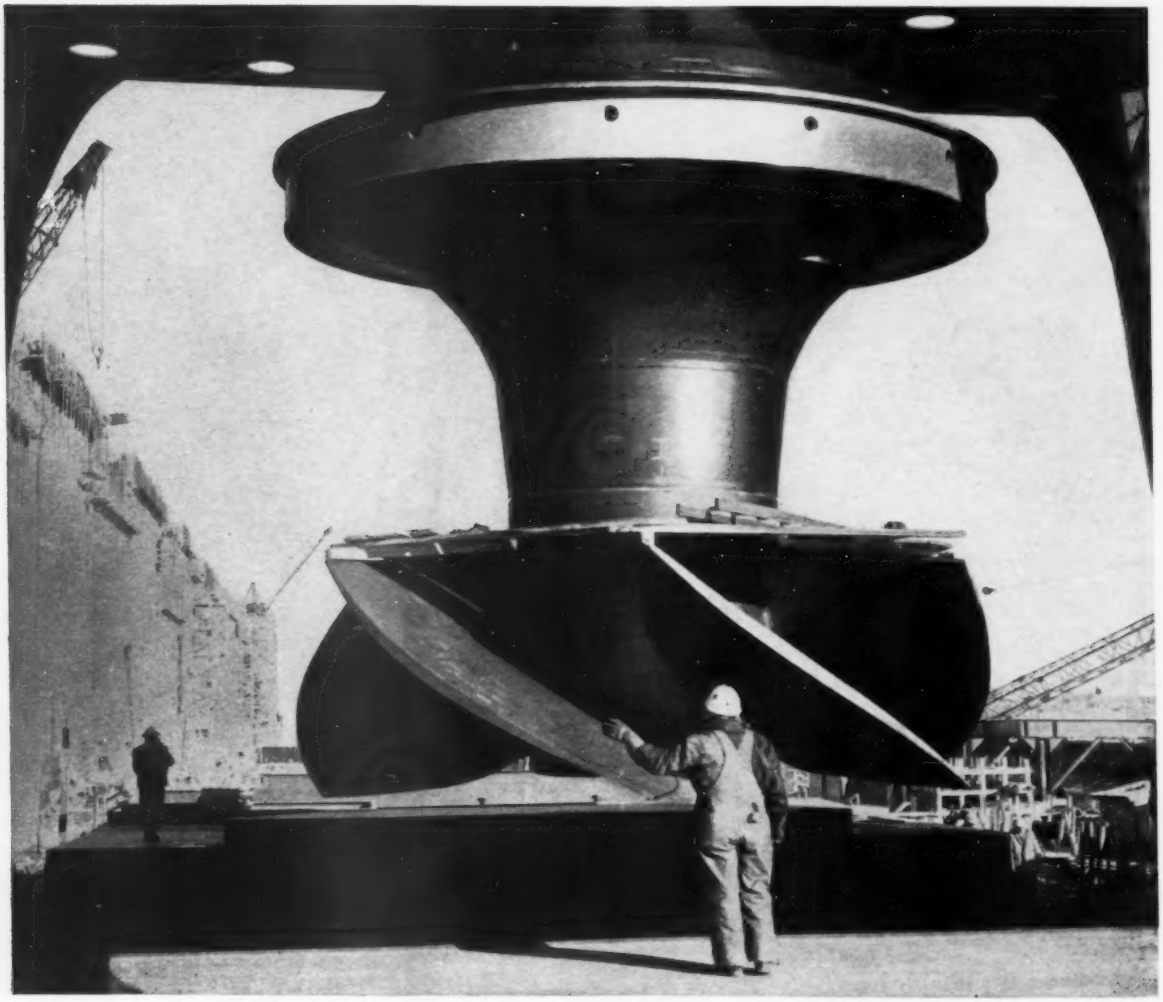


Sketch of Barnhart Island Powerhouse, courtesy Power Authority of the State of New York.

The St. Lawrence Seaway and Power Project is the largest engineering feat ever undertaken on the North American continent. Involved in it is the relocation of main highways, railroads, navigation facilities, and, in certain instances, entire towns. The Power Project alone will call for 86 million cu. yd. of excavation.

All power will be generated at the Barnhart Island Powerhouse, where deliveries are now under way on an order for eight Baldwin-Lima-Hamilton fixed blade propeller turbines. Each of these giants is rated to produce 85,000 hp at 94.73 rpm under 81-ft. head. The last of the eight B-L-H units for this enormous Canadian-American undertaking is scheduled to be completed and ready for shipment in Dec. 1958.

The St. Lawrence Power Project is only one of the many hydroelectric operations throughout the world that have called upon B-L-H's 130 years' experience in designing and building hydraulic turbine equipment. For specific information about our products and services, write to B-L-H Corporation, Philadelphia 42, Pa., or Pelton Division (B-L-H), 2929 Nineteenth Street, San Francisco 10, Calif.



Installation at the St. Lawrence Power Dam, Barnhart Island, N.Y., of a fixed blade propeller turbine runner built by B-L-H's Eddystone Division. Photograph courtesy Power Authority of the State of New York.

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